VOLUME 1 • JULY 1959 • NUMBER 1

# A.M.A. ARCHIVES OF GENERAL PSYCHIATRY

A. M. A. Archives of General Psychiatry
*Roy R. Grinker Sr.*

Some Difficulties of Psychotherapeutic Practice
*John E. Gedo*

Potentiating Effect of Alcohol on Tranquilizers and Other Central Depressants
*Ernst Kopmann and Francis W. Hughes*

Obsessions of Infanticide
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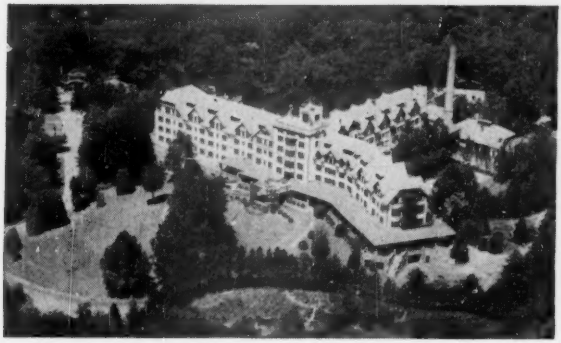

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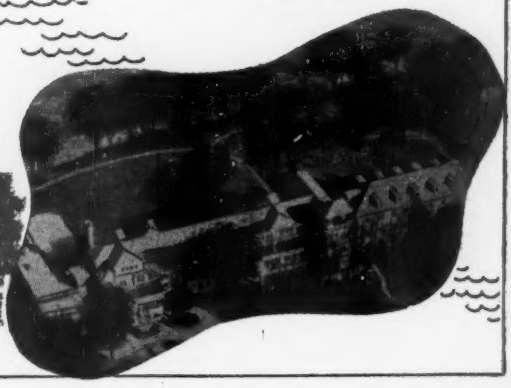

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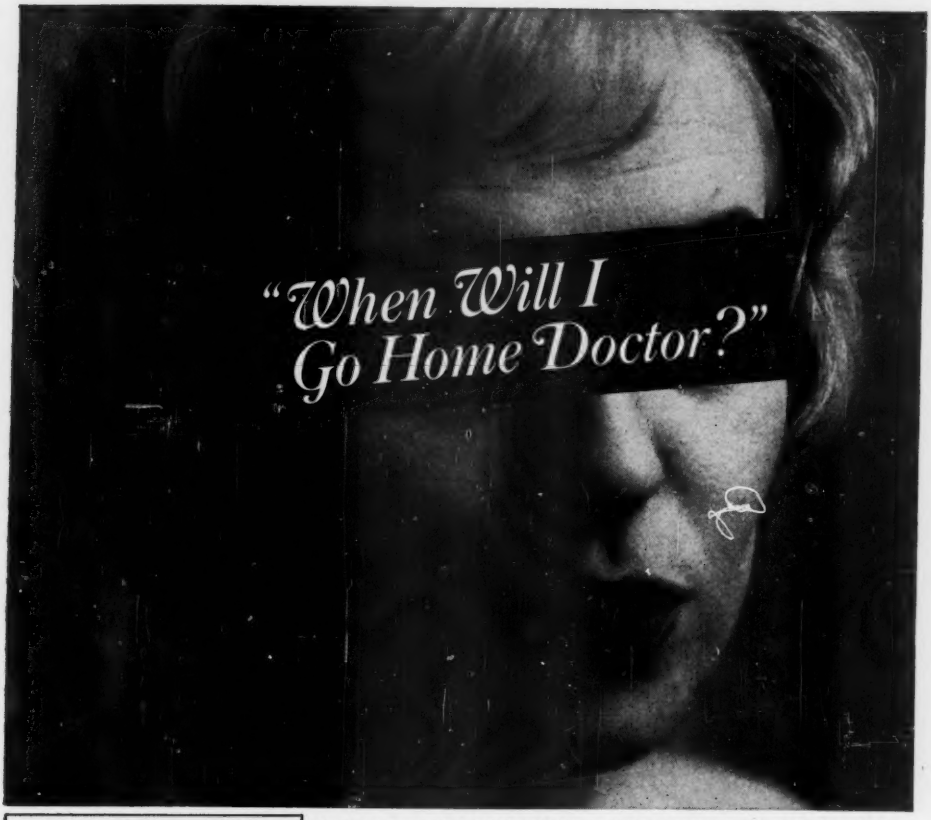


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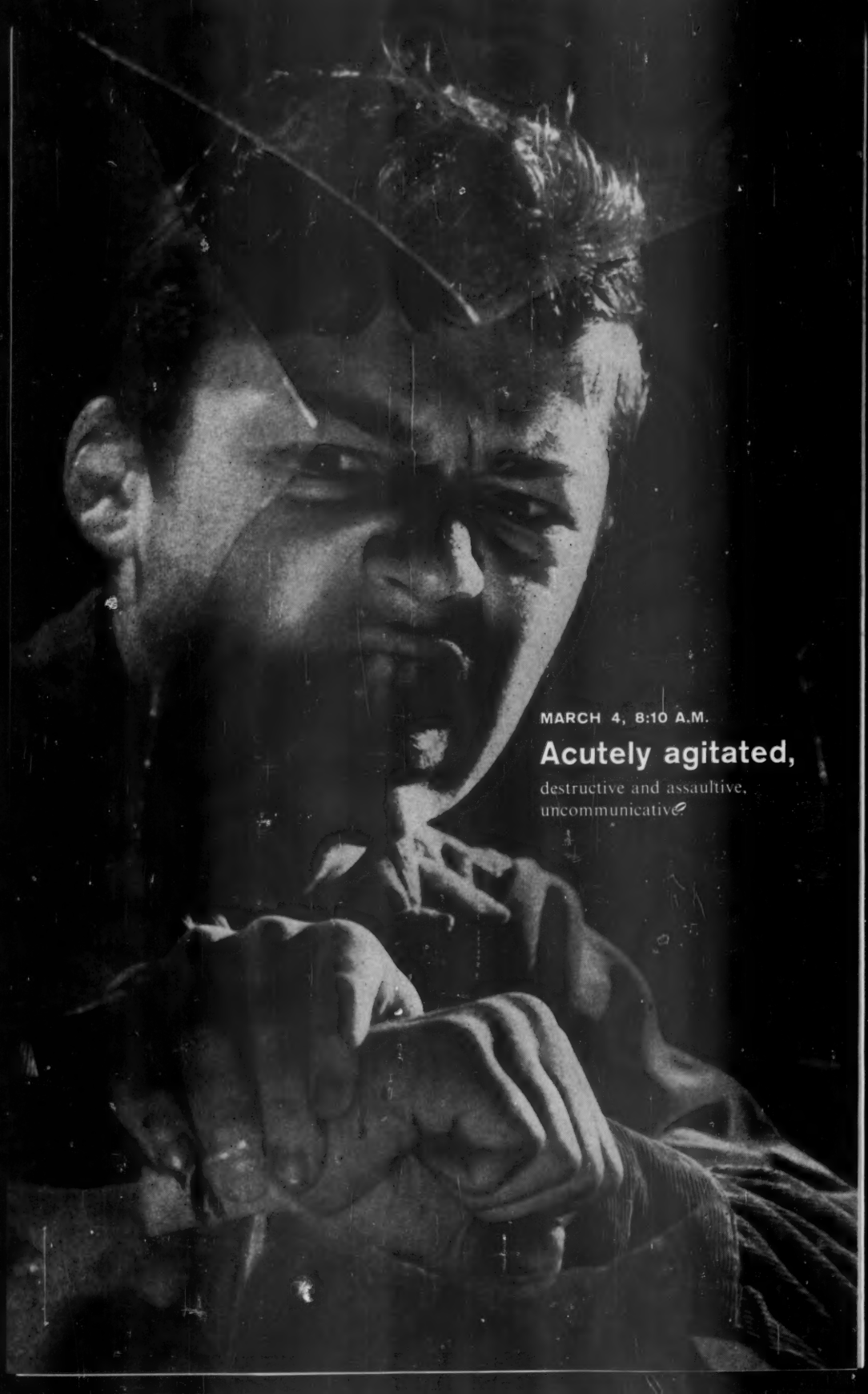
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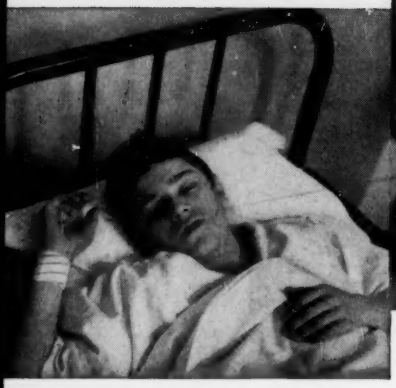
destructive and assaultive,
uncommunicative



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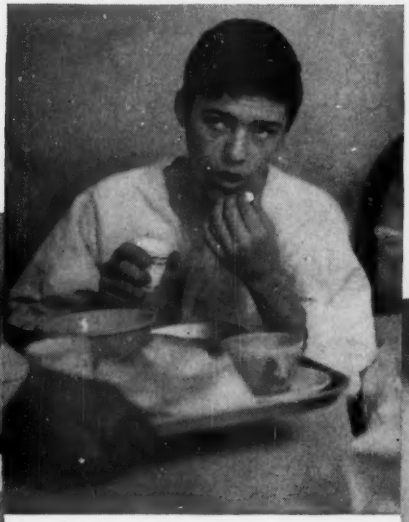
Patient in light sleep.
Can be awakened readily,
and responds to questioning.



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Quiet but alert. Contrite
about smashed window.

**MARCH 8, 9:00 A.M.**
Still on oral
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A.M.A. ARCHIVES OF
GENERAL PSYCHIATRY

Editorials

# A. M. A. Archives of General Psychiatry

Since the creation of a separate psychiatric section for the *A. M. A. Archives of Neurology and Psychiatry,* in 1956, the number of excellent manuscripts submitted for publication has increased tremendously. Furthermore, the quality of these contributions has improved to the extent that rejection for lack of space has been difficult and painful for the editors, so that we chose to accumulate a backlog of papers, which has become quite large. Within the added space allocated to this new journal it is expected that more articles can be published in shorter time.

A more important reason for the establishment of a new *Archives* devoted entirely to psychiatry is the realistic recognition that neuropsychiatry has become separated into neurology and psychiatry as distinct clinical specialties. Each group of specialists has been penalized by receiving an *Archives* of which only half interests it. Although it is true that the structure, function, and pathology of the central nervous system are significant aspects of the basic sciences necessary for the training and development of the broadly educated psychiatrist, the details of existing clinical neurological knowledge are of little interest or practical use, and are not remembered. It is, instead, the extrapolated broad principles that are of importance for the congruence of physiological and psychological functions. Certainly, the psychiatrist should read and understand current research leading to breakthroughs of existing barriers to proper understanding and treatment of the major psychoses, such as the newer psychopharmacology, as well as the selected basic advances in neurophysiology significant for the understanding of psychodynamics and psychopathology. These works we shall continue to publish.

Psychiatry is defined as a specialty of medicine concerned with mental and emotional disorders, and its recognized practitioners are physicians. However, they rarely work clinically in isolation, but cooperate with psychologists, social workers, and, lately, various types of social scientists. A vast number of nonmedical disciplines not only learn about personality and its disorders from psychiatrists, but also contribute greatly to advances in their knowledge. The psychiatric field is increasing in breadth and depth and needs a forum for the many life disciplines concerned with its progress.

Therefore, the Editorial Board has recommended the creation of this, the A. M. A. Archives of General Psychiatry. We shall publish contributions from all disciplines, whether morphological, physiological, biochemical, endocrinological, psychosomatic, psychological, psychiatric, child-psychiatric, psychoanalytical, sociological, or anthropological, that are related to the study of the behavior of Man in health and illness. We shall attempt to implement the concept

that Man's behavior cannot in our day be viewed profitably from a narrow frame of reference. Instead it requires a broad vision of a totally integrated field composed of many part functions and transactions, which constitute the focus of a wide variety of scientific disciplines. Eventually a unified science of behavior may emerge.

In this ARCHIVES we shall publish theoretical, observational, clinical, and experimental contributions, as well as overviews on topical subjects without concern with space. Reviews of noteworthy books by members of the Editorial Board will be published as quickly as possible. We shall not publish society transactions, news items, announcements, and abstracts of current literature, since these are adequately covered elsewhere.

The Editorial Board sincerely trusts that students of the behavioral sciences will profit by this broadly planned ARCHIVES and cordially invites them to submit their contributions for publication.

ROY R. GRINKER SR., M.D.
Chief Editor

# A Cumulative Index

Beginning with this first number of the new A. M. A. ARCHIVES OF GENERAL PSYCHIATRY is an innovation which will be of considerable value to its readers. Each monthly number of the ARCHIVES will contain a cumulative index, a feature not offered by any other periodical.

The mechanics of this index are quite simple. The first number will be comprehensively indexed; the second number will include an integrated index for both the first and second issues, and so on until the sixth issue, which will include, as usual, an index for the entire volume of six issues.

There are several advantages of a cumulative index: 1. Each current index will serve to locate in previous numbers articles not read or skimmed through, articles whose reading has been delayed for various reasons, and important papers for which a rereading is desired. Often in a library accessible to many readers many issues are out on loan, so that the current journal with its comprehensive index will serve to locate the number desired for recall. 2. Reference to papers appearing in previous issues is facilitated by a cumulative index without the necessity of looking through the table of contents of each issue before the final index of the entire volume is received. 3. Making a cumulative index issue by issue will tend to make the final index more complete and more accurate and shorten the time necessary for its construction.

The managing editor will be pleased to receive comments on the value of the cumulative index after the readers of the ARCHIVES OF GENERAL PSYCHIATRY have acquired experience with its use.

# Some Difficulties of Psychotherapeutic Practice

JOHN E. GEDO, M.D., Chicago

In recent years some attention has been focused on the long-neglected problem of patients turning down the recommendation of psychotherapy or dropping out of treatment after a few visits. Aside from Freud's dictum that his initial difficulties in persuading patients to undergo psychoanalysis were succeeded in later years by an equal problem in inducing them to leave, this question has aroused little interest. A paper by Frank, Gliedman, and others [1] stressed various significant attributes of the patients as the crucial determinants governing their staying in therapy. These patients presented good evidence that poorly motivated and severely ill patients are less likely to stay. Kohrman and co-workers [2] came to similar conclusions in a study awaiting publication. Katz and Solomon [3] concluded that patients who continue treatment are aware their problems are psychological and can communicate this, that continuation of therapy depends on attributes of both patient and therapist, but that the patients' desire and readiness play a "very decisive part," and that therapists liked and felt hopeful about those patients who subsequently stayed.

My personal interest in this subject was stimulated by my experiences in private practice. I attempted a statistical study of my case material [4] and found that lack of motivation and severity of psychopathology were indeed the characteristics distinguishing the patients who "dropped out." (In addition, lower social-economic-educational status appeared to be a factor of secondary importance.) This kind of study left many things unsaid, however, which are of equal, or even greater, importance. In this paper I shall attempt to convey the emotional climate in which these therapeutic separations take place in the hope that this will illuminate not only the therapist's role in the interruption of treatment but also the impact of these events on the psychiatrist (particularly one who first establishes himself in practice, has no backlog of regular patients, and consequently sees many new referrals and experiences a high rate of turnover).

Submitted for publication Sept. 4, 1958.

From the Division of Neuropsychiatry, Michael Reese Hospital.

## Report of Cases

This emotional climate is well illustrated by the case whose premature termination gave me the incentive to begin thinking about this problem.

CASE 1.—A 25-year-old divorcée of upper-class background sought help because of severe panic after the suicide of her fiancé. Aside from direct support, she was confused about what she wanted from me; she had been in "analysis" some years before for nine months but had left in confusion to make a very bad marriage to a paranoid person. She gave a history of severe emotional deprivation in childhood; no adult had remained steadily in her environment. In spite of her outward sophistication and vocational success, the patient had never succeeded in forming a stable human relationship except for the one which had just terminated in the partner's death. The suicide was the result of her breaking off the engagement when the man refused to seek help for a depression; the patient was unwilling to continue the relationship without getting the emotional satisfactions that she wanted. She did not seem to feel any guilt over her role in the tragedy.

Weekly interviews were begun, and the panic disappeared rapidly. The history came out gradually in the first four sessions. My only comment had been to draw a parallel between the two men in her life; this similarity she strongly denied. When I did not insist on my view, she became quite anxious and talked of her pattern of cutting off relationships abruptly. By the end of the fourth visit I had stated my view that her problem was the inability to maintain meaningful ties to people,

and I offered to see her in twice-a-week treatment. She responded by great anxiety, and in her fifth hour she brought out various excuses to justify quitting. When I interpreted her fear of entering a more intense relationship, she showed dramatic relief. It was then clarified that she would not have to come more frequently unless she wanted to. She left the hour in childish glee, stressing how very nice, courteous, and considerate I was being. She then sent me a letter to announce she wasn't coming back. I called her to find out why; she was literally unable to give a reason, but remained adamant about stopping treatment. She stated her intention of consulting someone else.

I feel that the patient was unable to tolerate contact with me because she interpreted my efforts to be considerate of her as signs of vulnerability. My "niceness" produced the development of unmanageable transference in a very short time—I think she was afraid that she would destroy me as she had, in reality or fantasy, destroyed everyone else in her life until then. That I was being *too* nice, concerned, etc., is demonstrated by the fact that I felt quite upset about her quitting, had to call her to inquire, and have unusually copious notes on the case.

I think that my irrational attitude was dictated by overidentification with this patient, whose emotional needs I wanted to meet in a parental fashion, thus acting out an unconscious wish of my own.

This patient had good motivation, the most favorable socioeconomic background, and I both liked her and was hopeful about helping her; yet she quit. In this case, then, the termination of therapy was caused by an attribute of the therapist. In checking over those instances in which a premature interruption occurred but I had enough data to form a retrospective judgment about what had caused it (i. e., I had seen the patient at least four times), I found that in most instances (about 75%) I had made a major therapeutic error. In a few cases (about 25%) it was the patient's life situation which had changed, causing a radical shift in motivation—these separations were much less surprising, painful, and guilt-laden for me and constituted a much milder blow to my self-esteem.

Case 2.—A 30-year-old clerical worker came to me in a panic when his schizophrenic wife abandoned him. He had to be hospitalized for three weeks, in the course of which it became clear that he needed his wife, whom he had been able to control and manipulate, in order to master his separation anxiety. The patient had suffered repeated abandonment by his mother in childhood because she had to be hospitalized for tuberculosis on several occasions. His father died when he was 2 years of age.

The patient continued outpatient psychotherapy after his discharge from the hospital, when his anxiety abated. After a few weeks of this, his mother became severely ill and entrusted herself completely to the patient's care. This fortuitous change in external circumstances magically fulfilled the patient's neurotic needs and made therapy into a threat to their enjoyment. Consequently, he abruptly stopped treatment.

In this case, and in all the others like it, it was possible to understand the patient's motive in stopping treatment. This eliminated the need for self-reproaches and reduced the anger at being thwarted in one's therapeutic ambitions and at being forced to find another patient.

In still another category, it was easy to find consolation for being "rejected" by the patient because this outcome was mainly the responsibility of the person who made the referral. When such a referral is an ambivalent one (the outcome of a mutual ambivalence between the referral source and the therapist), it seldom eventuates in fruitful treatment. The therapist can then at least feel "holier than thou."

Case 3.—A young man was referred for psychotherapy because of his distress about inability to leave his parents and continued financial dependence on them. He seemed eager to get help but did not return after the first visit, as he felt he could not afford to pay me. Later I learned that he was accepted for therapy at a clinic. The colleague who had referred him never gave an understandable reason for doing so; he had just established his private practice and was soliciting referrals at the time. He had seen the patient once and had not charged him for his visit. His tentative diagnosis was ambulatory schizophrenia—a view for which neither I nor anyone dealing with the patient at the clinic found any real evidence. The referring doctor had structured the situation in such a way that the patient was bound to react to my asking for a reasonable fee with anger and flight. The

referring doctor and I were involved in a highly competitive situation elsewhere.

In sharp contrast to this, the overwhelming majority of patients referred to me by my personal friends stayed in therapy.

A greater number of premature terminations caused me sharper feelings of disappointment, however. This was particularly true when I invested much therapeutic ambition in treatment or tried to use the patient for some other narcissistic goal of my own. In such instances, the patient's leaving is not merely a blow to one's self-esteem but, more poignantly, a revelation of one's untherapeutic, exploitative conduct, which leads one to feel remorse.

CASE 4.—A 32-year-old schoolteacher was hospitalized because of panic resulting from losing a former therapist, who had become schizophrenic and involved the patient in her religious delusions. The patient responded with an identification with the therapist, so that when first seen she appeared overtly delusional herself. Daily visits in the hospital produced a rapid disappearance of the psychotic material and left a seductive, hysteroid girl with great dependent longings, which she erotized.

As an outpatient, she was seen twice weekly and continued her amazing improvement. She gained insight into her need to please others, especially her mother, who had always expected her to be a complete failure; and she made an intense, ambivalent mother-transference to me. After about six months of brilliant progress, I became very enthusiastic about my handling of this case and began to have conscious fantasies about scoring a great coup by curing such a sick patient, publishing the case, etc. I was shocked when the patient seized upon a ridiculous pretext to quit therapy, without prior warning. Although this was a "negative therapeutic reaction," I feel that it resulted in the end of therapy (and a return of the religious delusions) because I had begun to use the patient for my own narcissistic ends, as her mother had always done.

There was a feeling of loss in the escape of such a patient quite different from the realistic loss experienced when a patient dropped out for reasons not connected with the therapist's neurotic needs. The kind of countertransference problem described in the last example constitutes a primary psychoeconomic gain, exactly as any other neurotic symptom would. The realistic inconvenience of losing a patient simply because of errors due to inexperience is much easier to take. Such a mistake occurred in the following case.

CASE 5.—A 29-year-old housewife was referred to me for psychotherapy. She had been depressed for almost a year, had made one serious suicide attempt, and had two psychiatric hospitalizations, one course of electroshock therapy, and no improvement. She was confused, indecisive, and adrift, and felt unable to cope with her two growing children, especially whenever her husband's time-consuming work made him too busy to give her emotional support.

The patient was very self-depreciating, ashamed about needing help, full of hopelessness, and she complained that I was unfriendly, impersonal, and distant. She wanted me to be interested, to take notes, and to think about her between visits. In the fifth interview it became apparent that the illness had been precipitated by her husband's changing his occupation, so that he could spend much less time with her than before. At this point the patient's mistrust and reserve seemed to have lessened considerably, and she looked perceptibly better. She wanted to cancel the next of her weekly interviews in order to arrange a long weekend, including Memorial Day, and I acceded to her wishes, not realizing that I was failing the crucial test she had set for me: Was I truly interested in her welfare; i. e., would I insist on seeing her?

On her return a fortnight later, she was adamant about stopping therapy, because, she said, it had brought her no benefit.

Finally, there are a number of cases in which the patient's decision to terminate treatment prematurely arouses in the therapist a mixture of guilt and *relief*. This occurs when the countertransference is primarily hostile in nature or the patient threatens to expose some unconscious, unintegrated, and unacceptable impulse of the therapist by achieving an insight which the therapist does not have about his own self.

CASE 6.—A 34-year-old dining-car waiter started treatment with me while I was in residency. He came to the clinic with severe anxiety and a phobic reaction to trains when he found that his wife had had a child by another man. Once-a-week supportive help was given, while the patient divorced his wife and established himself in his own business. His anxiety decreased to premorbid levels after a year. At this point the patient decided to look into his lifelong personality problems and requested more intensive therapy. He was then seen twice a week, for a year in the clinic, and for the last four months of the treatment in my private practice. He related to me in a passive, submissive,

dependent manner until he began to pay me; with the switch to my private office, he began to express some hostile and competitive feelings, although rather fearfully and obliquely. This behavior culminated in his burning my new table with his cigarette at the end of an hour. He became quite panicky and offered to pay for the damage. Although I was aware that the accident was in reality a symptomatic act, I was unable to deal with the situation on the spot (I was then just starting to deal with the same problems in my own analysis); I told the patient not to worry about the cigarette burn. He never came back.

I believe that the patient had to leave treatment because he realized my inability to deal with his competitive hostility. I was unable to interpret a crucial aspect of the transference and had lost my usefulness to him. (I am not implying that this single incident caused the interruption of treatment; rather, I believe that it was symptomatic of a consistent failure on my part to deal with the patient's hostility and was only the straw that broke the camel's back.)

To recapitulate, the problem of the patient who quits therapy prematurely is one of the most distressing vicissitudes of psychotherapeutic practice. Although the recent literature stresses that most such patients are poorly motivated and severely ill (a conclusion fully supported by my own experience), a review in detail of my case material reveals that the primary responsibility for such interruption of psychiatric contact is seldom the patient's alone. When this *is* the case, the therapist usually understands the changes in circumstances which bring this about, so that he suffers relatively light blows to his self-esteem. It is a much graver blow to lose a patient in the more numerous instances in which the separation is stimulated by the therapist's errors. It is because increasing experience and greater maturity reduce the frequency of one's therapeutic mistakes that patients tend to drop out more frequently at the beginning of one's psychiatric career. Moreover, the young psychiatrist is unlikely to have resolved his own neurotic problems, multiplying the chances for irrational misuse of patients, severe countertransference problems, and crippling scotomata for one's own unconscious impulses. It is when the psychiatrist's therapeutic activity serves as a satisfaction of neurotic needs in this way that the loss of patients by desertion is the severest narcissistic blow, leading to anger, guilt, and depression.

In focusing on the shortcomings of the therapist as a major factor in driving patients out of treatment, I do not mean to imply that this is the *only* factor in any given instance. Some patients are so ill and/or poorly motivated that even the most skillful therapist cannot avoid a mistake which will be fatal to treatment. Nor do I wish to convey the impression that I regard such errors as a sign of the psychiatrist's inadequacy—on the contrary, I believe that it requires constant vigilance and self-scrutiny on the part of every therapist to avoid them.

55 E. Washington St. (2).

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# Potentiating Effect of Alcohol on Tranquilizers and Other Central Depressants

ERNST KOPMANN, M.D., and FRANCIS W. HUGHES, Ph.D., Indianapolis

The introduction of drugs, such as the ataraxics, with a central activity other than that of hypnosis, sedation, or anesthesia, has created the problem of selectively testing this different type of activity. Usual pharmacological procedures have been inadequate in differentiating the central inhibitory action of these drugs. Pharmacologists have turned to standard psychological testing devices, hopeful that they might reflect drug-induced changes in the brain. Mazes have been used which demand that the animal-subject make a proper choice in order to be rewarded. A more popular plan is the use of a shocking-grid-box, in which an animal will receive an unpleasant shock of low amperage if he does not react to a warning stimulus. These warning signals may consist of bells, lights, or buzzers. When an animal has been so warned of an approaching unpleasant stimulus, he must react in a certain manner in order to forestall or prevent the hurtful experience. The mode of escape may mean climbing a pole or rope, jumping on a platform, or moving through a barrier.[1-5] The newer psychotherapeutic agents may change this escape reaction by reducing the response to the primary nonpainful stimuli. This has been interpreted as a measure of the reduction of anxiety of the animal. We have enlarged the repertoire of an experimental animal by providing two choices of escape. This newly introduced factor of *discrimination* allows an added measurement of the response to centrally acting drugs. The possibility of tranquilizers potentiating the depressant effect of alcohol has received much scrutiny. Certain of the tranquilizers, notably chlorpromazine and reserpine, will potentiate the effect of alcohol when inactivity or "sleeping time" is used as the criterion.[6] By the same measurement, some of the other tranquilizers fail to show a potentiative character.[7] In this study we are using an extinction of a learned response under shock-avoidable conditions in order to see whether there is a potentiative character of the combination of ethanol with other central depressants.

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Department of Pharmacology, Indiana University School of Medicine.

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## Methods and Results

The apparatus which we have used has been previously described.[8] This apparatus combines the principle of the conventional shock-avoidance-box with the principle of the two-choice maze. Our shock-avoidance-box consists of three compartments—the larger one has a shocking grid and contains a light (60 watts). This main compartment is separated from two smaller ones by a guillotine-type door. One of the two smaller compartments contains the same shock grid as the main compartment, but the other has a smooth insulating material as a flooring. In addition, a low-intensity light illuminates the unsafe area at the time the animal is exposed to the light in the main compartment.

After a rat is placed in the main compartment, the 60-watt light is turned on for five seconds, and then a shock is delivered if the animal has not made an exit. The guillotine door is left up for five seconds while the animal receives shock, and is

lowered at the end of this period if no response has taken place. Shock is continued for five seconds more. If the rat responds correctly to the light by entering the safe-escape compartment, the trial is concluded. If the rat makes an incorrect response either to light or to shock, the door is lowered, and the five seconds' shock is continued in the unsafe compartment, which the animal has entered. This system effectively enlarges the animal's repertoire to five countable responses.

1. Correct response to light; i. e., animal enters safe compartment after the stimulus of light (L+).

2. Incorrect response to light; i. e., animal leaves main compartment upon stimulus of light but still receives shock in unsafe-escape compartment (L−).

3. Correct response to shock; i. e., animal did not respond to light but enters safe compartment upon stimulus of shock (S+).

4. Incorrect response to shock; i. e., animal did not respond to light but enters unsafe compartment upon stimulus of shock and there receives further shock (S−).

5. No response to light or shock; i. e., animal does not leave main compartment upon light or shock stimulus, and door is lowered and five-second shock is further administered (TS). From the above five possible responses we have made the following grouping:

A. Anxiety (L+ plus L−): All responses to light, whether correct or incorrect, showing that the animal is able to respond to this derived stress. If the number of total responses to light decreases, strength of anxiety as a drive has been reduced.

B. Discrimination (L+ plus S+): Both of the correct responses, whether made under the stimulus of light (anxiety) or shock (direct stress).

C. Inability to respond (TS): Either to shock or light, indicating complete inability to respond to either direct stress or anxiety. Animal takes shock.

Extinction of a learned response by central depressants was measured over a period of seven hours after injection of these depressants. Three trials were made each hour. Ethanol was administered with the other depressants in order to see whether it effected a potentiative or an additive action on anxiety reduction, loss of discrimination, or inability to respond when combined with these central depressants. Thirty male Harlan-Wistar rats (150-175 gm. weight) were trained to respond correctly in 100% of instances before the testing period started. Each hour after injection of the drug each rat was given three trials to determine whether extinction and return of the previously learned response had occurred for a total of seven hours. A completely randomized design was used in which each rat received all of the drugs in a random order. At least 48 hours elapsed between each test of extinction. This was a $2\times7\times30\times7$ factorial design, the four factors involved being (*a*) ethanol, two levels—0 and 3 gm/kg.—(*b*) potentiators, seven levels—sodium glutamate 2 gm/kg., chlorpromazine 2 mg/kg., reserpine 0.5 mg/kg., pentobarbital 10 mg/kg., meprobamate 100 mg/kg., phenaglycodol 100 mg/kg., and distilled water—(*c*) subjects, 30 levels—Rats 1 to 30—and (*d*) hours after treatment—7 levels, from 1 to 7. The drugs so chosen represent various types of action, as well as diverse over-all clinical effects, and are chemically unique. Pentobarbital and alcohol allow a comparison with a depression or sedation other than that of tranquilization. Sodium glutamate was included in this study because a previous report by us indicated that glutamate has a central type of action which is unusual in that it increases the potentiative capacity of certain types of tranquilizers but not of others.[9] The drugs

TABLE 1.—*Analyses of Variance and Significant Tests of Factors*

| Source of F-ratios | Discrimination Loss L+ plus S+ | Anxiety Reduction L+ plus L− | Inability to Respond Increase TS |
|---|---|---|---|
| Ethanol | $P<0.001$ | $P<0.001$ | $P<0.001$ |
| Potentiators | $P<0.001$ | $P<0.001$ | $P<0.001$ |
| Subjects | $P<0.001$ | $P<0.001$ | $P<0.001$ |
| Hours after treatment | $P<0.001$ | $P<0.001$ | $P<0.001$ |

TABLE 2.—*Reduction of Anxiety* in Rats*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| (*a*) Alone | Phenaglycodol 43.18% $P<0.001$ | Meprobamate 73.33% $P<0.001$ | Alcohol 74.92% $P<0.001$ | Reserpine 94.92% Nonsig. | Sodium glutamate 97.94% Nonsig. | Chlorpromazine 97.94% Nonsig. | Pentobarbital 99.05% Nonsig. | Distilled Water 100% |
| (*b*) Combined with alcohol | Phenaglycodol 10.64% | Meprobamate 21.43% | Chlorpromazine 52.54% | Pentobarbital 62.38% | Reserpine 63.65% | Sodium glutamate 70.00% | | |
| (*c*) Potentiation | Meprobamate $P<0.001$ | Chlorpromazine $P<0.001$ | Pentobarbital $P<0.02$ | Reserpine Nonsig. | Phenaglycodol Nonsig. | Sodium glutamate Nonsig. | | |

* Anxiety measured as percentage of trials in which rats responded to light (L+ plus L−); 630 trials per treatment.

were all administered intraperitoneally. Analyses of variance of the various factors were made, and all of the factors proved to be highly significant when $F$-ratios were taken (Table 1). This allowed a further investigation of intergroup comparison by the $t$-test technique.

The treatments have been ranked according to the rats' ability to make an escape response under the drive of anxiety before shock was administered in the main compartment (Table 2). The first line (*a*) indicates that phenaglycodol, meprobamate, and ethanol are highly significant in their ability to reduce the strength of this drive when given alone. With the dosages used, this drive was not significantly altered by reserpine, glutamate, chlorpromazine, or the barbiturate. Line (*b*) shows the action of these drugs when combined with ethanol and also ranks them in absolute order. Line (*c*) indicates that meprobamate, chlorpromazine, and pentobarbital are significant in potentiating the reduction of anxiety, whereas phenaglycodol, reserpine, and sodium glutamate have only an additive effect. We have listed in Table 3 the effect of the treatments on the loss of discrimination. Alone phenaglycodol, ethanol, and meprobamate are significant in decreasing discrimination, but this is not significantly reduced by reserpine, glutamate, pentobarbital, or chlorpromazine. Line (*b*) shows the effect of combination with ethanol and lists the combined treatments in an absolute order. Line (*c*) shows the potentiation and indicates that meprobamate, chlorpromazine, phenaglycodol, and pentobarbital are all significant but reserpine and glutamate have an additive action only.

Table 4 shows the failure of the animals to respond to light or to shock, and the drugs are ranked in order of decreasing strength. It can be seen that phenaglycodol, alcohol, and meprobamate in the dosages used are highly significant in increasing the

TABLE 3.—*Discrimination* Loss in Rats*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| (*a*) Alone | Phenaglycodol 54.44% $P<0.001$ | Alcohol 78.10% $P<0.001$ | Meprobamate 80.48% $P<0.01$ | Reserpine 98.73% Nonsig. | Sodium glutamate 99.37% Nonsig. | Pentobarbital 99.84% Nonsig. | Chlorpromazine 100% Nonsig. | Distilled Water 100% |
| (*b*) Combined with alcohol | Phenaglycodol 14.13% | Meprobamate 27.30% | Chlorpromazine 52.62% | Pentobarbital 65.71% | Reserpine 70.32% | Sodium glutamate 75.56% | | |
| (*c*) Potentiation | Meprobamate $P<0.001$ | Chlorpromazine $P<0.001$ | Phenaglycodol $P<0.001$ | Pentobarbital $P<0.01$ | Reserpine Nonsig. | Sodium glutamate Nonsig. | | |

* Discrimination measured as percentage correctness in all responses to light or shock (L+ plus S+).

TABLE 4.—*Inability to Respond* *

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| (*a*) Alone | Phenaglycodol 42.25% $P<0.001$ | Alcohol 19.20% $P<0.001$ | Meprobamate 18.41% $P<0.001$ | Reserpine 0.64% Nonsig. | Sodium glutamate 0.16% Nonsig. | Pentobarbital 0.16% Nonsig. | Chlorpromazine 0.00% Nonsig. | Distilled Water 0.00% |
| (*b*) Combined with alcohol | Phenaglycodol 84.50% | Meprobamate 71.42% | Chlorpromazine 41.00% | Pentobarbital 32.00% | Reserpine 28.10% | Sodium glutamate 22.20% | | |
| (*c*) Potentiation | Meprobamate $P<0.001$ | Phenaglycodol $P<0.001$ | Chlorpromazine $P<0.001$ | Pentobarbital Nonsig. | Reserpine Nonsig. | Sodium glutamate Nonsig. | | |

percentage of trials in which the animals took shock. Chlorpromazine, sodium glutamate, barbiturate, and reserpine have no significant effect. Line (*b*) ranks the potentiators in absolute order when they are combined with alcohol. When these drugs are combined with alcohol, meprobamate, phenaglycodol, and chlorpromazine have a potentiating action that is highly significant. Glutamate, reserpine, and barbiturate have an action which is that of addition. Especially noteworthy is the action of chlorpromazine, which by itself had no effect, but when combined with alcohol was highly significant.

## Comment

The over-all results confirm generally the belief that chlorpromazine is a true potentiator. This tranquilizer has been reported effectively to potentiate the hypnotics, analgesics, and anesthetics.[6,10] In our study the behavioral response of the rats is inhibited in that anxiety and discrimination as they are operationally defined are diminished by combination of alcohol with this ataraxic and not by the tranquilizer alone. Also, the incidence in which the animal took shock is enhanced by chlorpromazine when combined with alcohol. Reserpine was used in a dosage form that effected responses similar to those of the animals receiving distilled water. When the drug was combined with alcohol, it was not possible to show any effect other than that of addition. This may have been due to the selected dosage of this ataraxic, and the possibility of the effectiveness of larger doses is being explored.

Meprobamate and phenaglycodol by themselves reduced anxiety and discrimination, while they increased the total number of trials in which the animals did not respond to light or to shock. When these two drugs are combined with alcohol, the results indicate a greater effect than that of an additive quality. These drugs are used in relatively the same clinical dosages and so were administered herein to the animals in equal quantities.

Sodium glutamate was used in this study in order to restudy the possible central depressant action of this compound. The results with this drug were not of a significant level with the dosage used. Pentobarbital was used as a representative of the barbiturates and demonstrated unusual properties. By itself pentobarbital was not significantly different than distilled water. The combination of alcohol and pentobarbital caused a decrease in anxiety, as well as a decrease in discrimination, but produced no greater than additive "take-shock" reactions. The meaning of this is difficult to elucidate but does suggest an increase in the state of tranquility produced by alcohol if it is combined with barbiturates without inhibiting the ability of the subject to respond.

It is difficult clearly to define a tranquilizer. Certainly, a state of "sedation" can be effected by many drugs, including alcohol. The patient who is receiving tranquilizing therapy and who ingests alcohol presents a clinical picture which is difficult to measure,

owing to overlapping measures of responsiveness, muscle control, and lack of inhibition. As we have operationally defined them, discrimination, anxiety, and inability to respond are three separate entities and are affected by various central depressants in different degrees, and they are potentiated differentially. The gradient of the emergence of the above three entities is independent of one another. A desirable property of a tranquilizer is that it will not diminish performance. In fact, it possibly may increase the efficacy of a patient by the removal of a distracting anxiety. Potentiation by an easily acquired drug, such as ethanol, would be undesirable under most circumstances.

## Summary

Extinction of a learned response under shock-avoidance conditions involving a two-choice discrimination situation was studied in rats.

In a newly designed apparatus we have measured anxiety reduction, discrimination loss, and inability to respond, as operationally defined. Phenaglycodol, meprobamate, and alcohol decreased anxiety and discrimination and increased the inability to respond. When the drugs were combined with alcohol, however, anxiety was potentiatingly reduced by meprobamate, chlorpromazine, and pentobarbital. Loss of discrimination by alcohol was potentiated by meprobamate, chlorpromazine, phenaglycodol, and pentobarbital. The complete inability to respond as induced by alcohol was also potentiated by meprobamate, phenaglycodol, and chlorpromazine.

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# Obsessions of Infanticide

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A particular type of obsession which occurs in women is the fear that they may murder their children. It is usually coupled with an obsessive dread of incipient insanity. These two obsessions complement each other, the patients fearing that ideas of murdering their children must, of necessity, indicate insanity, and that it is the insanity which will lead to the unnatural act of infanticide.

I have had the opportunity of observing over the past five years 20 such patients, who provide the clinical material for this study. Six of the patients were seen diagnostically only, and fourteen others were followed in treatment. Sufficient similarity exists in the clinical picture and course of these patients to permit a discussion of their obsessive illnesses as a fairly distinct entity in the field of obsessive pathology. Discussion with colleagues has indicated that this clinical problem occurs with sufficient frequency to merit attention. A search of the medical literature revealed no previous reported studies devoted to this specific subject.

This type of obsessive illness occurs, as would be expected, in women between their late teens and early 40's, the child-rearing period. It tends to occur particularly in the age group between 25 and 35, and in women with two or three children. I have not seen this difficulty in women with four or more children, and it seems uncommon in women with one child. It would be expected that exceptions to this general tendency will occasionally occur, however.

Such obsessions are much less commonly observed in men, and appear to be transitory and less severe when they do occur. I have seen only two men who had such obsessions, and they were mild in severity and of brief duration. A major reason for this difference in incidence is probably the much more intense and intimate relationship that mothers, as opposed to fathers, have with young children. Other reasons will be apparent from later discussion of the psychopathology behind these symptoms.

The children whose infanticide is obsessively feared are almost invariably in the first 10 years of life and are evenly divided in sex. The mothers suffering from these obsessions fear the infanticide of boys as often as girls, and rarely fear infanticide of children beyond 10 years of age. This may well be due as much to the time of life that the mothers develop this difficulty as to the age of the children, for if the mother does not develop the difficulty during the first several years of the child's life, she seems not to develop it at all.

The mothers may obsessively fear the murderous act by a variety of means, but the commonest is by stabbing, decapitation, or strangulation. They fear that they may stab or decapitate the child with an axe, paring knife, butcher knife, sharp scissors, or similar instruments. Stabbing in the chest or complete decapitation is most commonly feared. Many of these women cannot bear to go near the cabinets where axes or knives are kept, for fear that the impulse may overtake them with the sharp instrument so near at hand. Often they dread to pick up the paring knife for simple kitchen chores, for fear that once the potentially fatal instrument is in hand they will irresistibly proceed to harm their children.

Elaborate fantasies accompany the obsessions, such as fantasies of themselves standing over the bloody, multilated bodies

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of their children. Often they envision the newspaper headlines which report the gruesome act, and they daydream newspaper photographs showing themselves being led away to jail or to a psychiatric hospital after the murder. The shock and distress of husbands and relatives are sometimes fantasied. All such fantasies are accompanied by intense anxiety, or sheer panic.

The patient as a rule will confide her obsession to her husband promptly, but rarely tells anyone else. The husband is usually not alarmed about the possibility that his wife may harm the children, but is concerned over her marked anxiety and upset. The husband may wonder whether his wife is actually on the verge of "losing her mind," as she fears; but as a rule he is not much worried over this possibility. He will reassure his wife repeatedly, and then in time considers seeking medical help, as he finds his reassurances are of little avail.

The patient feels more comfortable if another adult is always at hand, for she feels that the other person would restrain her if she ever began to carry out the infanticide. The prospect of being left alone in the house with the children terrifies her, for she feels that this prepares the scene for the execution of her obsession. Rarely, the panic occasioned by being alone with the children is so severe that another adult must be engaged to stay in the home when the husband is absent working.

The length of time elapsing between the onset of symptoms and psychiatric consultation is very variable. I have seen patients who have had their symptoms for a week or two, and others who had endured them for periods up to 14 years in length. The patients may delay psychiatric consultation for long periods, for fear that the psychiatrist will pronounce them insane and imminently homicidal and urge long-term commitment to a mental hospital. When the psychiatrist does not recommend such a step, they are at first relieved, but later feel that the psychiatrist has made a potentially tragic error.

There are no social-economic limitations in the range of patients with this problem. It may occur in working-class, middle-income, or wealthy women, and in patients with varying degrees of education. Several of my patients were wives of professional men, but all social and vocational groups were represented. Religious orientation, both in denomination and in degree of piety, seems to have little bearing on the incidence of the problem.

Often a precipitating event was described. One patient had the onset of symptoms after reading a newspaper article about a woman who was accused of drowning her child. Two patients had their first obsessive symptoms within a few days after the birth of a second child. One patient had the beginning of her illness two weeks after the death of her mother. In other patients, no clear precipitating factor could be described, though they might outline quite clearly the first time they had such obsessive thoughts. One woman, for instance, could describe clearly her position standing looking out a schoolroom window when her symptoms first began, 14 years prior to psychiatric consultation.

These patients are painfully sensitive to any mention of violence after the onset of their symptoms. They are made very anxious if they read of murder, automobile accidents, or violent deaths in the newspapers. Often they stop reading the newspapers and avoid radio and television. To hear of violence accentuates their symptoms and seems to them to weaken their ability to restrain themselves from the violent act they fear they may commit.

At times the number of persons involved in their murderous obsessions may expand to include neighborhood children, the husband, or other close relatives. These other persons, as a rule, are not persistently involved, and the obsession soon reverts exclusively to their own children.

Fluctuations in the intensity of the obsessions occur. The patients describe "better days" and "worse days" and often feel the

obsessions come on them in acute painful waves. The early morning and bedtime are particularly painful. The patients awake, dreading to face another day of misery, which might, they feel, be the day on which the infanticide will finally take place. Bedtime is feared, for sleep is interpreted as a lapse into a slighter degree of self-awareness and self-control, and they fear that any such relaxing of vigilant self-control will permit the obsession to erupt into action. Insomnia is a frequent complaint in these patients.

Most such patients live in constant fear of "losing control." To them such a "loss of control" is synonymous with insanity and also with the commission of the murderous act. They envision themselves as continually on the verge of "going beserk" and "running amuck." They view themselves as fighting a continuous battle to prevent collapse of their self-restraint, which, they feel, stands weakly between them and infanticide.

In my experience these patients do not become psychotic, and I have not observed schizophrenic development in any of them. Often there is secondary depressiveness, but this is felt by the patient to be an appropriate affect to the tragedy they believe imminent. Suicidal thoughts may occur at times, but they are brief as a rule, and of the same obsessive quality as the fears of harming their children. They dread the idea of suicide rather than experiencing any urge to commit it. I have not observed any suicidal attempts or gestures in these patients.

It is difficult to know what the course of such an obsessive illness would be without psychiatric intervention. Probably, in such instances, the symptoms persist for a long period of time, from a number of months to several years or more, and then wane gradually, often when the children enter into their pubertal and adolescent stages. Whether or not other symptoms then replace them, one cannot say, but one would guess that such women remain subject to anxiety states and, perhaps, psychosomatic symptoms. These women often complain of upper gastrointestianl symptoms, posterior nuchal tension headaches, and muscular tenseness in the thorax, arms, and legs. One patient developed a duodenal ulcer and hemorrhaged from it. It is probable that the patients continue such psychosomatic symptoms, or further develop them, when the obsessions finally cease. It would seem that the obsessions eventually disappear in virtually all of these women, for I have seen only one patient past the age of 50 with this trouble; she had mild obsessions of this nature regarding her grandchildren.

Usually, other obsessive symptoms do not occur, and compulsive rituals in these patients are extremely rare. In a few patients there was a history of mild previous obsessive symptoms, and two of them developed other obsessions after the inception of the obsession of infanticide. However, it is striking that the coupled obsessions of infanticide and insanity in these patients were usually the only obsessions they ever had. Mild phobias were present in three of the patients; one woman had a mild agoraphobia, and two patients had mild phobias of automobiles. Often the patients fear to drive an automobile, but this was interpreted by them to be due to their feeling that an automobile was a potentially lethal instrument to themselves, other occupants of the car, or pedestrians.

The psychopathology of these patients was not uniform, though certain distinct trends were present. Although a similar personality picture or identical psychodynamic process could not be found in every one of them, some features were found to be common in a number of the patients.

Twelve of the patients were very passive women, who had little capacity for expression of anger or self-assertive feelings. Persons around them viewed them as unusually "easygoing," and often commented on the fact that they never became angry. They had great difficulty asserting themselves regarding their privileges or rights, and were often dominated by co-workers and relatives. They had much difficulty in even such minimally assertive acts as returning grossly defective merchandise to department stores.

They feared that any assertiveness or expression of anger would lead to rejection of them by pepole, and would end in painful social isolation. They were very sensitive to any expression of open anger by other people toward themselves and feared that they would similarly "hurt" people badly if they became angry with them. Passivity seemed the only course open to them.

Usually such patterns of passivity and suppression of anger originated in relationships with parents, often mothers, who did not tolerate any expression of anger or assertiveness by the patient. They were made to feel intensely guilty about any angry expression, or parental love was painfully withdrawn at such times. The patterns of intense guilt and anxiety about assertiveness were laid down in the early formative years and carried later into adult relationships.

This group of patients had great difficulty in being sufficiently assertive with their children to enforce minimal discipline. The tensions between them and the children often became very difficult, as the undisciplined children excited more suppressed anger in the mothers, who, in turn, were unable to curb their increasing misconduct. Tearful, pleading harangues took the place of firm discipline.

Beneath their passive façades, these patients had great amounts of turbulent, suppressed anger. At times they were vaguely aware of this themselves, and feared a "breaking of the dam," with the outburst of excessive angry acts. On a superficial level, this was behind their obsessions of infanticide.

Their children, the ostensible objects of their homicidal obsessions, were in reality only superficial objects behind which were the patient's parents, the true objects of their original fury. Intense guilt was present over the pent-up anger. The obsession of incipient insanity often represented a punishment for the unacceptable angry feelings toward the parents, who had never permitted in these women a healthy development of the capacity to express reasonably angry and assertive feelings. The coupled obsessions of infanticide and insanity thus represented the displaced expression of hostility and the punishment for having such unacceptable hostile feelings.

A second, and much smaller, group of patients, who did not show, as a rule, such passivity, had experienced overt sexual trauma in childhood which initiated the pathologic process leading eventually to their symptomatology. One patient had, for example, been sexually seduced by her stepfather for several years during her puberty and early adolescence. During this time her mother had developed a schizophrenic illness, resulting in her permanent commitment to a state mental hospital. Another patient had for years, in her childhood, been warned by her emotionally disturbed mother that the father had incestuous desires for her, and this patient's initial sexual orgasms occurred during masturbation, while listening to her parents have intercourse. Another patient was subjected to a very traumatic sexual seduction in childhood. In each of such patients, the early sexual trauma led to intense hostility and guilt, and incited a pathologic process which laid the basis for adult neurotic symptomatology.

The first patient described above, for instance, felt that her sexual relations with her stepfather had been discovered by her mother and that this shock was a major factor in the precipitation of her mother's psychosis. The patient felt she could remove this guilty burden only by herself suffering the same fate by becoming insane. The children she feared she might kill were displaced objects of the intense hostility she felt toward the stepfather who seduced her and caused her so much later agony. The psychodynamics in other cases of childhood sexual trauma were varied.

Another type of problem is illustrated by a patient who was particularly obsessed with the idea that she would decapitate her son. She had very much wished for a girl at the time her son was born. Several months later, while diapering her son, she had the fantasy

that if she would cut off his penis, he would be somewhat like the little girl she had desired. This momentary thought was lost immediately from memory, and her obsession of decapitating the child began shortly afterward. When this memory was recaptured in treatment, she made rapid progress toward losing her symptoms. Behind this fantasy were older problems of competition with males in her childhood and dissatisfaction with being a girl. One other patient had a dream of cutting off the penis of her son.

Other psychodynamic problems which were found involved relationships with cold, hostile, compulsive parents. Often problems in raising their own children reawakened in these women memories of painful events in their own childhood, and old conflicts were reactivated. In three cases the children whose infanticide was feared were consciously not wanted at birth.

Rorschach examinations were done on most of these patients. No evidence of schizophrenic processes was found. Depressive features were minimal. Strong evidence of anxiety, and phobic and obsessive features were commonly observed in the Rorschach protocols of these patients. Often there was a marked constriction of the capacity to express a wide spectrum of affects, affectionate as well as hostile. Hysterical features were not found.

The most important factor in prognosis seemed to be the length of time that symptoms existed before psychiatric help was sought. Those patients who sought help relatively promptly tended to do well, while those who delayed for long periods of time did poorly. The passive patients whose crucial problems lay in anger expression and guilt and fear over such angry feelings tended to do well in treatment. Those patients who did not have overt problems in assertiveness, but whose main problem seemed to lie in childhood sexual trauma, were much more difficult. The severity of the patient's panic and anxiety at the time of first consultation did not appear important in determining the eventual prognosis. The treatment used with these patients was psychotherapy, which varied flexibly in frequency and length, depending on the needs of the patient and her capacity to engage in interview treatment. In general, they were found to be an interesting and gratifying group of patients with whom to work, and the majority made good progress, with eventual loss of their presenting symptoms. None of them were hospitalized.

## Summary

The clinical picture, psychopathology, and prognosis of obsessions of infanticide in women are discussed. The obsession of infanticide is usually associated with an obsessive fear of insanity, and these coupled obsessions constitute a clinical problem that is often amenable to help by psychotherapy.

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# Morphology and Other Parameters of Phantasy in the Schizophrenias

*A Phenomenological and Statistical Approach to Dreams and Other Works of the Imagination As They Occur in the Natural History of Schizophrenic Illness*

**DANIEL CAPPON, M.B., M.R.C.P., D.P.M., Toronto**

" . . . We are such stuff
As dreams are made of and our little life
Is rounded with a sleep."
—*The Tempest*

## Introduction and Definitions

The originial observations from which this study was projected were made in the course of my clinical practice. It seemed to me that the form, structure, or morphology of phantasies in general, and of dreams in particular, corresponded with the extent, depth, and degree of latent and manifest mental illness in general, and the ongoing schizophrenic illness in particular. This relationship has already been noted in "Schizophrenic Art."[1]

The schizophrenias are herein defined as illnesses with an etiology ranging from primarily heredoconstitutional-organic to primarily psychogenic. They have in common a progressive disarticulation between the person and his environment. Within the person there is progressive disarticulation between mental structures and functions, with an eventual disorganization of nearly all mental structures and functions. The rate of progression in this disarticulation is a measure of the activity of the illness.

Phantasy is herein defined as a fundamental phenomenon of mentation wherein the imaginative faculty of the person integrates experience with the environment and within himself. Phantasy integrates the stream of exteroceptive and interoceptive psychosomatic percepts with their primarily associated pleasure-pain affects, elaborating them at varying levels of awareness by interpretations and generally by ideation, thus absorbing tensions which provide the impetus for its production. Phantasy ranges through four levels of awareness: the so-called "unconscious" level of the sleep-dream, the twilight level of the hypnoid dream, the quasiconscious level of the autochthonous wake-dreams, and the fully conscious level of active imagination. Dreaming is not only a basic but also a primitive kind of mentation, as it occurs in children and probably in some vertebrate animals. Its importance was great throughout recorded history.

Phantasy, at all levels of awareness, presents itself in successive percepts, ultimately emerging from within the person and usually mediated through the visual and visuokinetic modality. The forms of phantasy one may call "imagery" because they are usually, though not exclusively, visual.* The succession and contents of imagery have the structure of dramatic activity, that is, a representation of dramatis personae, a time and place, an established relationship among the

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* D. Cappon and D. Coates, in current work on "sensory deprivation and phantasy," show that the congenitally blind and persons incapable of revisualization also have dream "imagery," mediated by kinetic, auditory, tactile (texture), and gustatory modalities.

animate and inanimate objects, the logics of sequence, or peripety, and a lysis or ending or denouement. Moreover, there is usually a congruity of affect, a relation to day residue—that is, a continuity of experience (manifest content) gathered prior to sleep or prior to alteration in level of awareness, a message usually expressing a wish (latent content), and an appropriateness of symbolic representation. All these properties of phantasy give it a total form, structure, or morphology. Therefore, this morphology is categorizable in terms of orderliness in a range of progressive disorganization from unitary and montage to fragmental, amorphous, and chaotically kaleidoscopic. A logical sequence of imagery with a beginning and some sort of ending, largely reproducing the ordering of objects, time, and space experienced in the reality of waking existence, is herein designated as unitary, whereas a more digressive, rambling succession of imagery, yet with largely the ordering of external reality but loosely held together by a central thread of relationship and meaning, is herein called montage. A broken-up succession of imagery with no centripetal ordering force, disarticulated in itself and bizarrely estranged from external reality, is herein called nonunitary. Though further divisions have not been applied in this study, they are possible. If the main feature of the nonunitary phantasy is a lack of cohesion—no central thread—with no continuity even in the main character's role (the dreamer), it may de designated as fragmental. If the main feature is that of vagueness, like a ground-glass appearance on the dream-screen, a diffusive emotional experience, it may be dubbed as amorphous; and if the main feature is a splintered, disarticulated, hotchpotch, a cacophony of sound, and/or an eruption of kaleidoscopic imagery, it may be named chaotic.

Because it is simpler and more direct to depicit these categories then to describe them, this work will be illustrated by the paintings of patients whose own words are usually reproduced and whose own evaluation led to these parameters. All these paintings were stimulated by spontaneous imagery from within, with no consciousness of external objects to inspire them. Some of the paintings were actually representations of parts of a sleep-dream.

Figure 1 represents the distinction between chaoticism and some organization to the fragmental level.

Because the first manifestation of schizophrenic pathology is intrapsychic at the level of perceptual-ideational integration of function, it seemed reasonable to assume that therefore the imaginative work of phantasy would be the first affected. However, the experience of phantasy can never fully coincide with its report, for it has to negotiate censoring barriers within sleep, and others between sleep and wakefulness, before it is registered by memory. Then it has to overcome the hazards of translating the memorized image-traces into communicable verbal behavior, past the Cerberus-like guard that stands at the interface between intrapsychic subjectivity and its communication in behavior. Therefore, though phantasy may be the locus of incipient schizophrenia, reported phantasy cannot be taken as more than a parameter of its distorting and dissociative pathology.

## Patient Population

From a total population of some 1,200 patients representing all diagnoses, clinically known to me personally over the past eight years, 202 consecu-

Fig. 1.—Morphology of fantasy. Left, formless, chaotic imagery of the inner body and mind. Right, organization to object level, but still showing fragmentation (or compartmentalization), representing organ and ideas. Figs. 2 and 3.—Development and differentiation of imagery of self-percept to "object level." Serial visions of the change in mind and body represented in water color during the two years of psychotherapy. Birth of a phallus. Fig. 4.—Alternative end-points in the development of morphological organization of imagery to object level (often a mandala). Fig. 5.—Development of organized imagery form by differentiating doodles. Fig. 6.—Development of organization and differentiation to the levels of the movable objects of nature—man ontogeny repeats phylogeny and phylogeny repeats cosmogeny. Figs. 7 and 8.—Partial regression to childhood dream vision.

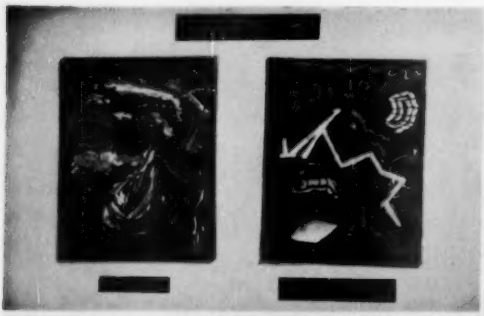

Figure 1

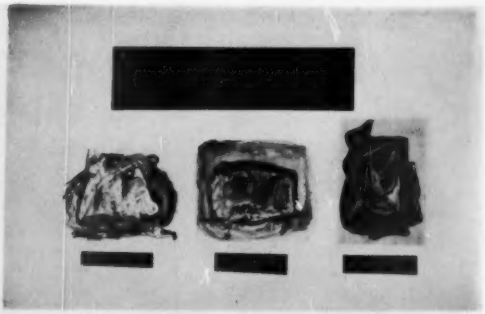

Figure 2

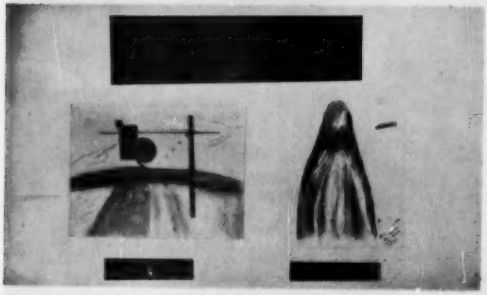

Figure 3

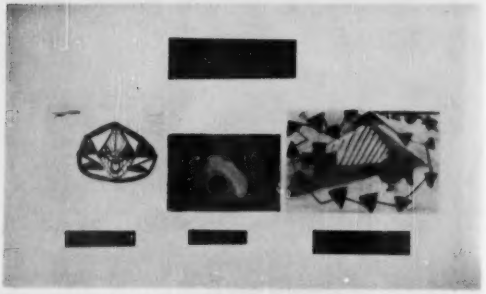

Figure 4

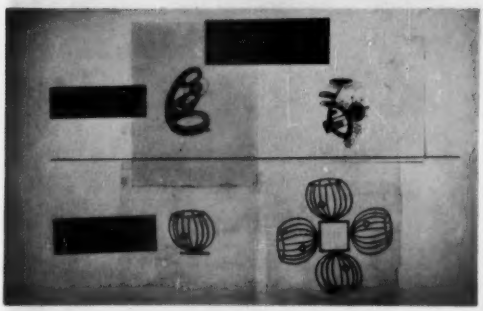

Figure 5

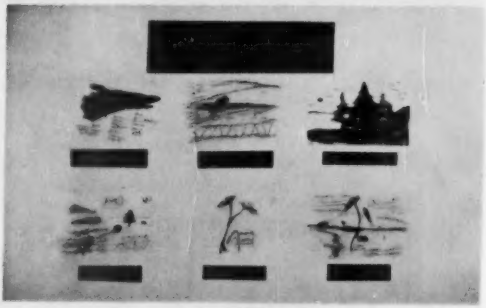

Figure 6

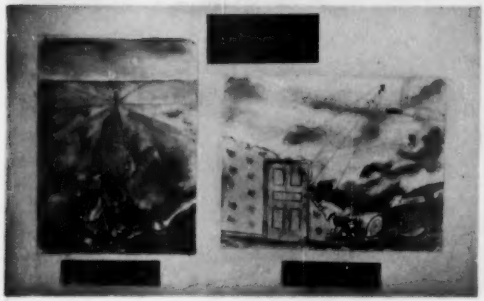

Figure 7

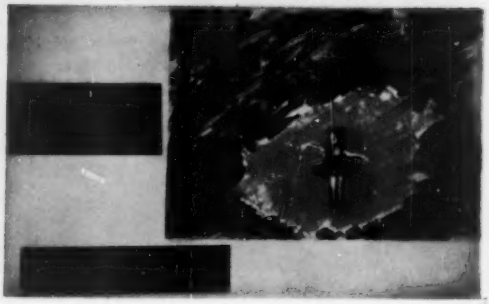

Figure 8

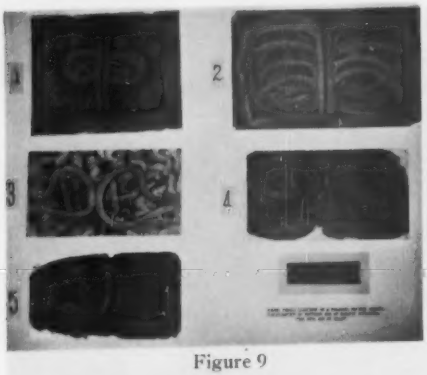

Figure 9

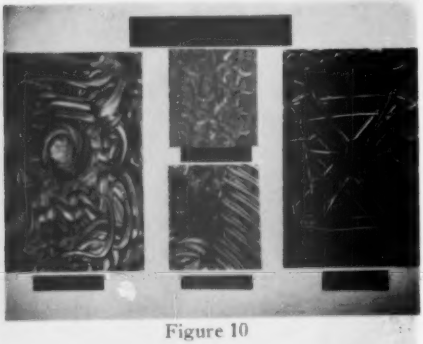

Figure 10

Figure 11

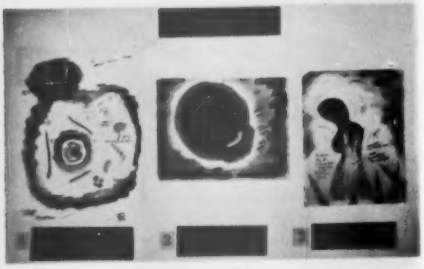

Figure 12

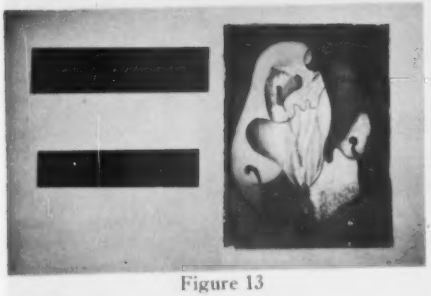

Figure 13

Figure 14

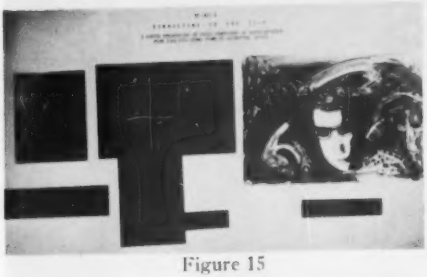

Figure 15

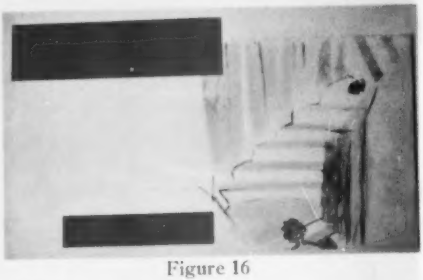

Figure 16

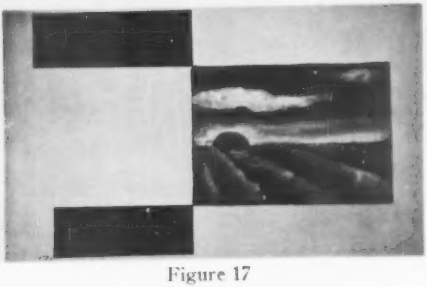

Figure 17

tive, mostly current, cases which had sufficient phantasy material were restudied specifically for this purpose. Of these patients, 21 were children, aged from 5 to 15, and 181 were adults, spanning the second to the fifth decade of life. They were divided equally between the sexes. They were seen in settings varying from a child guidance clinic, outpatient departments, or private practice to psychiatric and mental hospitals. They represented a fair cross section of the normal distribution of socioeconomic, ethnic-religious-cultural groupings in the community. Clinically they fell into three equal groups: Group I, the schizophrenias, recent (within the year) and more chronic (up to five years). These patients were grouped together ultimately because no clear-cut distinction could be found at this level of chronicity. Group II, the major character neuroses, with paranoid, schizoid, and obsessive dominants. These cases were eventually grouped together because of the commonality of psychopathologic features and phantasy parameters found in them. Group III, the minor neuroses, some patients with organic illnesses, and some "normals." These cases were also eventually grouped together when it was found that for the purpose of this study they could not be distinguished one from the other. In all instances in which schizophrenia was the diagnosis, the confirmatory opinion of one or more psychiatrists was obtained. These three groups were designated as the "clinical observation series." They were compared and contrasted with a separate group of 44 adult patients who had received a total of 1,330 nitrous oxide and/or carbon dioxide (70% $CO_2$+30% $O_2$) gas inhalations for dysphemia (stammering). These patients were equally divisible into the three primary groups of schizophrenia, character neuroses, and minor neuroses. They constituted the "experimental gas-inhalation (stressed) series."

On the "clinical observation series" of patients (Groups I to III) a total of 670 clinical observations were made on adults, then noted, categorized, and scored on formats; in addition, 100 clinical observations were made on the children and similarly scored.

On the "experimental gas-inhalation series" there were 1,330 gas stress observations. Thus, there were a total of 2,100 observations specifically on phantasy which were scored.

The fundamental statistical unit was not the person, or other levels of phantasy, but the sleep-dream, and 1,090 of these were collected and scored.

## Method

1. *Clinical Observation Series (Children): Qualitative Comparison*

In the course of child guidance activity, the children's morphology of phantasy was compared with the organization of their play and the results of psychological tests.

2. *Clinical Observation Series (Adults): Quantitative Methods*

The adults clinically observed were studied by qualitative (both analytical and purely descriptive) and quantitative methods.

Parameters of phantasy and their range were uniformly defined. A format was then constructed containing a maximum of 14 standardized items (parameters) of phantasy which were potentially pertinent, in addition to morphology (Appendix and Legend 1). Each dream was scored on this format for each patient. A note and score were also made of hypnagogic imagery and wake-dreams. Finally, at each session one minute was set aside when the patient was asked to close his

TABLE 1.—*Childhood Schizophrenia and Autism—Morphology of Phantasy in Various Diagnostic Categories Arranged in Order of Morphological Pathology Corresponding with Severity of Illness*

| Case No. | Diagnosis | Recorded Phantasy | Psychological Testing | Recorded Play |
|---|---|---|---|---|
| 17 | Schizophrenia | Chaotic and fragmental | | |
| 3 | Schizophrenia | Chaotic & Fragmental | Not tested | Chaotic |
| 18 | Schizophrenia | Montage | Montage | Fragmental |
| 21 | Cryptogenic autism | Fragmental | Not tested | Fragmental |
| 16 | Cryptogenic autism | Fragmental | Unitary | Fragmental |
| 12 | Psychogenic autism | Fragmental | Unitary | Montage |
| 4 | Schizoid psychopathy | Not recorded | Montage | Montage |
| 10 | Schizoid psychopathy | Montage | Montage | Unitary |
| 19 | Neurotic shyness | Unitary | Not tested | Unitary |

Fig. 9.—Serial finger paintings of a paranoid patient showing perseveration of patterns and of somatic references: "The Eyes and My Brain." Figs. 10. and 11.—Imagery of development and organization in finger-painting series. Fig. 12.—The spontaneous fantasy of two pregnant women. Fig. 13.—A male hermaphrodific preschizophrenic fantasy. Figs. 14 and 15.—A series progressing in their remoteness of representation from idealized human forms to archetypal levels. Fig. 16.—A dream fragment in water color representing remote archetypal symbolism. Fig. 17.—A dream vision: "Alone amid the sparkling waters and foam of the ocean before the rising red sun I see myself as an ether walking the waves."

eyes and let himself imagine what he would, and this was also noted and scored.

3. *Experimental Observation Series (Adults): Quantitative Method*

The adults submitted to $N_2O$ and $CO_2$ inhalations producing light anesthesia were uniformly treated (in terms of number of respirations, time of administration of gas, and average number of treatments, i. e., each, 30). It was possible to compare the degree of disorganization of their phantasy, the degree of ego regression in their phantasy (i. e., self-visualization or feeling of self at younger age levels to infancy and subhuman levels) with the degree of regression in their behavior. Also, it was possible to compare recurrence of phantasy with stereotype of behavior. Terms of reference to phantasy and behavior having again been rigidly defined, a suitable format was constructed and scored for each treatment on each patient (Appendix and Legend 2). All the formats were then translated into tables and submitted to statistical analysis, while the qualitative analysis was annotated systematically in each case.

## Results

1. Table 1 shows an attempt to relate the morphology of recorded phantasy (usually sleep-dreams told to mother and written down by her) to the degree of organization of formal aspects of the thought process as detected by psychological tests (projective and draw-a-person techniques) and then again compared with the degree of organization of play observed directly in the playroom. One can see the close relationship between the extent of disorganization of the phantasy, and hence play-behavior, of children and the degree of their schizophrenic illness. When allowances for age are made, it is found that the more definitely schizophrenic the patient the more chaotic the phantasy; in the middle range of autism the phantasy is moderately disorganized, whereas in neuroticism it is unitary.[2,3]

2. Disorganization of the formal thought process, beginning with phantasy, may be seen also in the toxic-confusional-deliriant states and in the total psychosomatic break-up of humans dying.[4] But there is a clear difference between these and the schizophrenic pathology of phantasy in the rate of development, in the quality of distortions, and in the rate and type of integration in remission. The toxic-confusional state develops faster, with a more random fragmentation of the perceptual process, a preference for visual-modality distortion, less stereotype in phantasy, more random symbolic distortions of the body and psychic selves, of objects, and of people, and a haphazard break-up of the order of sequence and lysis in the general picture of morphology. In the phase of integration there is a greater tendency for total restoration of function, beginning with restoration of the function of phantasy. People dying in other than a toxic-confusional state may break up their thought morphology at as slow a rate as in some more quickly developing schizophrenias, but as they fold up most of their phantasy organization is preserved in a more cohesive, orderly, unitary fashion than in schizophrenics. Once they have folded up, of course, there is no integration, no remission. Moreover, the clinical setting of the toxic or dying patient is obviously known to be different.

The accompanying paintings (Figs. 2-6) represent various stages of organization of the morphology of phantasy. The captions are paraphrased from the patients' own association on these imaginative projections on paper, which were recorded by them at different times of progressive psychic organization. The painting (Fig. 6) representing serial doodles in ink is particularly interesting, since it shows a complete evolution from a microcosmic nebulousness to the formation of objects of nature and, finally, man.

3. Table 2 shows that when gas-inhalation stress was applied to schizophrenics, who then lost consciousness, their phantasy was disorganized to a highly significant degree as compared with patients suffering from character neurosis. The latter, in turn, were more disorganized than patients with minor neuroses, organically ill patients, or "normals."

As in all subsequent Tables, Table 2 shows an arrangement of the patient of Groups I, II, and III, in order of pathology of the particular parameter of phantasy

TABLE 2.—*Morphology: Adult Schizophrenias—$N_2O$ and $CO_2$ Stress-Inhalation Series*

| Comparative Categories of Illness * | | Morphology of Phantasy (Dreams, Hypnoid Visions, Elaborated Percepts) | | Summary of Trends † Morphology | | |
|---|---|---|---|---|---|---|
| Groups | Types | $\chi^2$ All Groups ‡ | $\chi^2$ Intergroup and Intragroup | Unitary | Montage (Medium) | Nonunitary |
| I | Schizophrenias (chronic and early) | | I *vs.* II=sig. | | | |
| II | Obsessive, schizoid, and paranoid states | $\chi^2_{(4)}$=158.47 | II intragroup=Not sig. at 10% level | ↓ | ↓ | ↑ |
| III | Neuroses (other than obsessive) | PR<<0.001 V. sig. | | ↓ | ↑ | ↑ |

* In order of pathology of this parameter of phantasy.
† Shown by actual *vs.* statistically expected response.
‡ $\chi^2$-Goodness-of-Fit Test (Independence Test).

under scrutiny. That is to say, (*a*) the groups are homogeneous within themselves, as can be seen from the test done in the third column, showing that there is no significant difference inside each group, and (*b*) the groups differ significantly from one another. The level of significance of this difference, as tested by the goodness-of-fit, independence $\chi^2$-test, is very high, with a chance of error of much less than 1 in 1,000. In all these Tables, the second column shows the level of confidence one had for the significance of difference between all groups. As will be seen, it is remarkably high in nearly all these parameters. The third column shows the level of homogeneity within one or within more groups, allowing us then to compare one with the others. It also shows the degree of confidence that there is for the difference between two of the three groups, as a check on the previous test done for all three groups. The last column in each table should simplify the visualization of these statistics, for it summarizes graphically the general trend. In Table 2, as can be seen, the more unitary the morphology of phantasy while under gas-inhalation stress, the more likely we were dealing with normal or mildly neurotic people. The more trends toward a medium distortion of morphology of phantasy, the more likely we were dealing with a severe and established character neurosis, and the more nonunitary or totally disorganized the morphology of phantasy the more likely it was that we were dealing with schizophrenia. This likelihood anticipated by the clinician, and then, again, by the calculations of expected distribution laid out by the mathematician, was confirmed by actual numerical findings.

This situation of the degree of disorganization of the morphology of phantasy seems analogous to the degree of disorganization of morphology of tissue in neoplasia, benign and malignant.

TABLE 3.—*Morphology: Adult Schizophrenias—Clinical Observations Series*

| Comparative Categories of Illness * | | Morphology of Phantasy | | Summary of Trends † Morphology | | |
|---|---|---|---|---|---|---|
| Groups | Types | $\chi^2$ All Groups | $\chi^2$ Intergroup & Intragroup | Unitary | Montage (Medium) | Nonunitary |
| I | Chronic schizophrenias Early schizophrenias | $\chi^2_{(4)}$=156.72 | $\chi^2$ intergroup is V. sig. for all groups | | | |
| II | Paranoid, schizoid, obsessive states | PR<<0.001 | $\chi^2$ intragroup is non-sig. in each group | ↓ | ↓ | ↑ |
| III | Organic illness, neuroses, no illness ("normals") | V. sig. | | ↓ | ↑ | ↑ |

* In order of pathology of this parameter of phantasy.
† Shown by actual *vs.* statistically expected response.

4. Further, a correlation was established between the degree of disorganization of intrapsychic imagery (phantasy) while under gas stress and up to the point of regaining full consciousness, and the extent and kind of behavioral regression and pathology. Table 4 shows that there was a highly significant difference among all three groups in the way in which they behaved under gas, this behavior being noted in a standardized manner and scored on the protocol (Legend, Appendix 2). Moreover, there was a high correlation—as shown in Column 4 of Table 4, where $r$=the coefficient of correlation—between the degree of abnormality of behavior and the degree of morphological pathology of phantasy. As usual, the last column summarizes the picture graphically, showing that the less regressed the behavior correlating with the more unitary phantasy, the greater the likelihood we were dealing with normals or patients with minor neuroses; the more trends toward the medium-range distortion of phantasy correlating with partial regression or pathology of behavior, the more likely we were dealing with severe and established character neuroses; the more disorganized the phantasy correlating with regressed behavior, the more likely we were dealing with schizophrenia.

5. Turning now to the "clinical observation series" of patients to see whether the same relations exist between the degree of pathology of morphology of phantasy and the extent of illness, one finds that there would be, again, a less than 1:1,000 probability of error if one were to classify a patient as schizophrenic, character neurotic, or neurotic, organically ill, or normal on a fair sample of his morphology of phantasy (Table 3).

Now, apart from the general organization of the process of phantasy (morphology), there are other specific parameters which may measure the relative "health" of the symbolic process.

6. The extent of intrapsychic (ego) regression as gauged by the level of self-representation in imagery during phantasy

TABLE 4.—*Regression: Intrapsychic (Phantasy) Correlated with Extrapsychic (Behavioral) Regression—$N_2O$ and $CO_2$ Series*

| Comparative Categories of Illness * | | Regression in Phantasy | | Regression In Behavior | Corr. Btwn. Phantasy & Behavior | Summary of Trends † Phantasy | | | |
|---|---|---|---|---|---|---|---|---|---|
| Groups | Types | $\chi^2$ All Groups | $\chi^2$ Intergroup & Intragroup | $\chi^2$ All Groups | $r$ All Groups | Ego at Age Level | Partial Regress. | Total Regress. | Behavior |
| I | Schizophrenias | $\chi^2_{(6)}$=251.16 | I *vs.* III = sig. | $\chi^2_{(6)}$=558.76 | | | | | Total regress. |
| II | Obsessive, schizoid, paranoid states | PR<<0.001 | II intragroup | PR<<0.001 | PR=0.97 | | | | Partial regress. |
| III | Neuroses (other than obsessive) | V. sig. | $\chi^2_{(6)}$=42.53 | V. sig. | Sig. | | | | No regress. |
| | | | PR<<0.001 | | | | | | |
| | | | V. sig. | | | | | | |

* In order of pathology of this parameter of phantasy.
† Shown by actual *vs.* statistically expected response.

TABLE 5.—*Other Parameters of Phantasy in Adult Schizophrenias: Intrapsychic Regression—Clinical Observations Series*

| Comparative Categories of Illness * | | Regression in Phantasy | | Summary of Trends † Regression Range | | |
|---|---|---|---|---|---|---|
| Groups | Types | $\chi^2$ All Groups | $\chi^2$ Intergroup & Intragroup | Ego at Age Level | Partial Regress. | Total Regress. |
| I | Chronic schizophrenias | $\chi^2_{(4)}=214.35$ | $\chi^2$ intergroup v. sig. btwn. all groups | ↓ | ↓ | ↑ |
| | Early schizophrenias | | | | | |
| II | Schizoid, paranoid, obsessive states | PR<<0.001 | | | | |
| III | Organic illness; neuroses; no illness, ("normals") | V. sig. | $\chi^2$ intragroup not sig. within each group | ↓ | ↑ | ↑ |

* In order of pathology of this parameter of phantasy.
† Shown by actual *vs.* statistically expected response.

experiences is another such parameter. That is, the younger the self was represented in imagery or the dreamer felt himself to be in the action of the dream, the more regressed, to the level of infancy, and even to subhuman levels.

In the experimental series, intrapsychic regression was related to behavioral regression, and the correlation was highly significant, as can be seen from Table 4.

The three groups are distinguished from one another, in the usual order, in the parameters of both kinds of regression (at a level of confidence of more than 1:1,000), and the intercorrelation between behavioral and intrapsychic regression is significant (at $r=0.97$). Thus, the more regressed the ego in self-representation, the more regressed the behavior, and therefore the more likely we are dealing with schizophrenia. Again, in the middle ranges we find the character disorders, and at the normal range the minor neuroses, etc.

The reproductions of the paintings of two dream fragments projected by two middle-aged women demonstrate rather well the medium range of regression in imagery (Figs. 7 and 8).

7. The "clinical observation series" showed similarly definite results in the relationship of regression in self-image and degree of mental illness (Table 5).

8. Another parameter is the amount of compulsive repetition, or stereotype, of recurring images in phantasy. In our experimental series it was possible to relate this to the amount of stereotype of behavior observed during and immediately following the application of gas inhalation. (Appendix 2 shows the protocol on which this was evaluated and numerated.)

Table 6 shows once again that on this parameter the three groups were ordered in the same distinguishable range, that each of these manifestations of stereotypy—behavioral and imaginative—distinguished one group from the other, and that the two manifestations correlated highly ($r=0.91$). Thus, the trend was that the more stereotyped the phantasy, the more this is shown in behavior and the more likely we were dealing with schizophrenia. Again, the character neuroses were in the middle range, and the normals in the normal range.

The finger painting shown in Figure 9 is one of many scores of the same done by the one patient, and it illustrates his highly stereotyped preoccupation.

9. This time, when we look at this parameter "in vivo," that is, in the clinical series, we find that it does not distinguish clearly between groups (Table 7).

It is suggested that this trend is latent, so that under the stress of gas inhalations which have highly charged meaning, as well as physical effects, stereotype as a defense against chaotic imagery, disintegration of behavior, and, therefore, the cohesion of personality, becomes manifest.

10. The next set of parameters were grouped together for convenience and be-

TABLE 6.—*Other Parameters of Phantasy in Adult Schizophrenia: Stereotype of Phantasy and of Behavior—$N_2O$ and $CO_2$ Series*

| Groups | Comparative Categories of Illness * Types | Stereotype of Phantasy in Serial Inhalations | | Stereotype of Behavior | | Correlation Btwn. Phantasy & Behavior Stereotype | Summary of Trends † Stereo. in S. I. ‡ Phantasy | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\chi^2$ All Groups | $\chi^2$ Intragroup | $\chi^2$ All Groups | $\chi^2$ Intragroup | r All Groups | No Recurr. | Partial Recurr. | Total Recurr. | Behavior |
| I | Schizophrenias | $\chi^2(6)=142.81$ | II § | $\chi^2(6)=778.09$ | II § | r=0.91 | → | → | ← | Total stereo. |
| II | Obsessives, paranoids, schizoid § | PR<<0.001 | $\chi^2(6)=36.07$ | PR<<0.001 | Sig. | Sig. | | → | ← | Partial stereo. |
| III | Neuroses | V. sig. | PR<<0.001<br>V. sig. | V. sig. | | | → | ← | ← | No stereo. |

* In order of pathology of this parameter of phantasy.
† Shown by actual *re.* statistically expected response.
‡ Under the stress of gas inhalations (S. T.), the latent tendency for stereotype and obsessive organization as a defense against inner disorganization becomes significantly obvious and differentiates the groups.
§ Skewed by the outstanding stereotype of obsessive patients.

cause they might be more closely interdependent. They were as follows:

(*a*) Body perception—that is, imagery representing the physical self as a whole or in parts.

(*b*) Symbolism of the psychic self—that is, the symbolic representations of the person's own personality characteristics as a whole or in parts.

(*c*) Symbolism of the environment—that is, the imagery representing the persons, objects, situations, institutions, etc., the surroundings which enter into the person's inner world.

These three parameters were arranged in order of appropriateness-remoteness—that is, to the extent to which the person and his environment were represented as they really existed, they were considered "appropriate"; to the extent to which they did not so represent reality and were, instead, seen as weird, bizarre, archetypal, they were considered "remote." The middle category was derived from these two points. By archetypal representation one meant that that which was represented was not part of the person's actual experience, nor an experience likely to be encountered by any one in reality. It was a representation of some essential characteristic which transcended personal experience, yet is to be found in more or less identical forms transpersonally, and transculturally in the myths and images of peoples.† For instance, the dreamer may see himself as he really is, or, say, he may see an image of himself as degraded and depraved, or he may see himself as a gargoyle or a werewolf, in order of appropriateness. Similarly, "objects," animate and inanimate, might be represented in a range of distortion from explicable and realistic to apparently inexplicable, strange, contorted, outlandish.

(*d*) Ego involvement—that is, the position the dreamer takes in the sequence of imagery, i. e., central and hero or participant; on the fringe or observant only, or even absent. This could be considered as a measure of autoscopy in dreaming. The

† See the works of Carl Gustav Jung.

TABLE 7.—*Other Parameters of Phantasy in Adult Schizophrenia Stereotype of Phantasy—Clinical Observations Series*

| Groups | Comparative Categories of Illness * Types | Stereotype Serial Dreams, Sleeps $\chi^2$ All Groups | Recurrency Within the Same Sleep $\chi^2$ All Groups | Summary of Trends † No Stereo. | Partial Stereo. | Total Stereo. |
|---|---|---|---|---|---|---|
| I | Schizophrenias | $\chi^2_{(4)}=11$ | PR=not sig. | ↓ | ↓ | ↑ |
| II | Obsessive, paranoid, schizoid | | | | ↑ | |
| III | Neuroses, organic illness "normals" | PR>0.02 | | | | |
| | | Doubtful sig. | | | | |

* In order of pathology of this parameter of phantasy.
† Shown by actual *vs.* statistically expected response.

paintings in Figures 10 to 17 represent a sample of each of these parameters.

When these parameters were considered in the clinical series, it was demonstrable that they also distinguished in a statistically significant way these three groups of illnesses (Table 8).

The interesting thing, shown in Figures 10-13, is that from dream imagery referring to the body one could actually distinguish with a certainty of 1:1,000 the schizophrenic from the organically ill patient and both of these from the other categories of patients. The organically ill patient showed the greatest fixity of body reference; that is, he referred consistently in the same way to the body or part of it. He, and more rarely the neurotic, referred to the body appropriately, whereas the schizophrenic showed the greatest fluctuation of body reference; that is, he referred inconsistently to various parts of the body; moreover, his references were the most inappropriate. The character neurotic fell in the middle category.

Similarly, in the other parameters, the more remote the representation of the self, and the less involved the dreamer, the greater the likelihood of schizophrenia.

11. Finally, the last group of parameters which distinguished the phantasy of schizophrenias from that of character disorders and the phantasy of the latter from that of normals were as follows:

(*a*) Relation to day residue—that is, the degree to which the manifest content of the dream was traceable to the events of the past day(s).

(*b*) Relation to wish fulfilment—that is, the degree to which the dream manifests a wish expressed as a directly and positively desirable state. No attempt was made here to assess the latent wish, or to ascribe negative states, such as punishment or pain, to the notion of wishing.

(*c*) Instinctual drive—sexual spread—that is, the aim and direction of sexual situations and symbolism in the phantasy. These were graded from well-directed heterosexuality or homosexuality to a disorganized, chaotic spread, where more than two perversions are acted out without clear purpose, in a haphazard way.

(*d*) Lysis—that is, the ending, or denouement, or conclusion of the sequence of phantasy, varying from a happy conclusion, or some conclusion, as an indication of ongoingness or chronicity, finally to the threat or actualization of destruction or death.

In all these parameters there was a highly significant relationship among the groups in that the more decided the day-residue, the more obvious and the more positive the wish fulfilled; the more contained the sexual expression and the greater the tendency to solution of the dream sequence, the healthier the person.

The other parameter of instinctual drive, namely, the spread of aggression, when

TABLE 8.—*Other Parameters of Phantasy in Adult Schizophrenia: Body Perception, Symbolism of the Self, Symbolism in General, EGO Involvement—Clinical Observations Series*

| Comparative Categories of Illness * | | Kind of Phantasy Parameter | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (A) Body Perception † | | | | (B) Symbolism of the Self | | (C) Symbolism in General | | (D) Ego Involvement | | |
| | | Range: | | | | | | | | | | |
| Groups | Types | Fix. | Fluct. | Approp. | Med. Remote | Range: Approp. | Med. Remote | Range: Approp. | Med. Remote | Range: Total Inv. | Part Inv. | Not Inv. |
| | | | | $\chi^2$ All Groups | $\chi^2$ Inter-Group | $\chi^2$ All Groups | $\chi^2$ Inter- & Intragroups | $\chi^2$ All Groups | $\chi^2$ Inter- & Intragroups | $\chi^2$ All Groups | | $\chi^2$ Intragroup |
| I | Schizophrenias | | | $\chi^2(4)=84.82$ | $\chi^2$ I *vs.* II & III | $\chi^2(4)=186.17$ | $\chi^2$ Inter-group v. sig. for all groups | $\chi^2(4)=117.70$ | $\chi^2$ Inter-group v. sig. for all groups | $\chi^2(4)=182.39$ | | Not sig. |
| II | Paranoid, obsessive, schizoid states | | | PR<<0.001 | $\chi^2(4)=18.26$ | PR<<0.001 | PR<<0.001 | PR<<0.001 | | PR<<0.001 | | |
| III | Neuroses, ** organic illness, no illness, ("Normals") | | | V. sig. | PR<<0.001 | V. sig. | $\chi^2$ Intra-group not sig. | V. sig. | $\chi^2$ Intra-group not sig. | | | |
| | | Organic | | | V. sig. | | | | | | | |

* In order of pathology of this parameter of phantasy.

† Statistical trend — the category of organic illness differs from schizophrenic illness in that it shows the highest degree of fixity and appropriateness, whereas schizophrenia shows the highest degree of fluctuation and remoteness.

graded from normal and appropriate aggression to a spilling over of well-aimed hostility, and, finally, to an increasingly poorly directed hostility, ending in meaningless ravages or cataclysm, was not uniformly established. Inwardly directed aggression correlated with the lysis of the dream at least with respect to the dreamer, and so there was a significant difference in all groups, since lysis itself was a distinguishing parameter. However, externalized aggression did not distinguish the groups.

Nor was there any difference in the way in which these groups used the various modalities (visual, kinesthetic, auditory) as a sensory pathway for their dreaming. There was, in fact, such an individual variation in the specific usage of modalities that no group could be compared with the other.

Lastly, the frequency of dreaming showed that the more psychotic the patient, the less the tendency to report dreams. This finding was supported by the clinical observation that schizophrenics, and then obsessives, were the most reluctant groups in yielding active imaginations, especially in periods of remission. They frankly admitted fearfulness of the invasion of phantastic imagery, distortion of preceptions, and consequent ruminatory or dereistic, bizarre, and delusional thinking.

Observations on the passage of percepts and thoughts through levels of awareness from sleep to wakefulness during the ongoing schizophrenic process were difficult to quantify. At a fairly early point of great activity, sleep-dreams per se disappeared because they were subjectively indistinguishable from hypnoid and waking hallucinations; at another point of burnt-out schizophrenia they also disappeared, leaving a scorched, vacant, deprived imaginative faculty. The wild archetypes ‡ receded behind the cage of civilization. It seemed that in the natural history of the illness the first distortions appear (as with hallucinogens) at the hypnoid-twilight level in which

‡ For further definitions, see the works of Carl Gustav Jung.

perception of the self (body and psyche) and surroundings are interpreted in thinking. At this time sleep-dream imagery might be relatively clear of schizophrenic symptoms, though profuse in frequency of archetypal symbolization. Thence the invasion extended into daydreams and into the conscious imaginative faculty, which was taken up by the spreading distortions and lost its proper function. At this time the pathology of phantasy extended into sleep-dreams, which eventually also ceased functioning and became indistinguishable from hypnoid and waking states—hence, de Sanctis' saying that a dream "is nocturnal insanity"; Kant's, "A madman is a waking dreamer"; Schopenhauer's, "A dream is a brief madness," and Wundt's, "In a dream we are all insane."

*Per contra* one might say with Hippocrates that to the extent to which serial dreams departed from day residue, simple wish fulfilment, and unitariness of structure—and, we might add, appropriateness of body perception and of psychic self-representations—to the extent to which the ego was not involved and/or regressed, the dream experience stereotyped and its report perseverating; to the extent to which instinctual drives spread chaotically and cataclysmically in incontinent fashion, to that extent a schizophrenic illness existed. The lysis (ending) of phantasy, spontaneous or by active imagination, foreshadowed the psychological fate of the patient, or at least the intention of the dreamer.

## Comment

There are other measures applicable to dreams which might have been attempted.

(*a*) Incongruity of affect in the dream, which may be a prelude to symptoms of serious disarticulation of mental functions, manifesting itself increasingly at increasingly higher levels of awareness.

(*b*) The amount of hallucinatory intensity eventually making dreams more vivid than reality.

(*c*) The clarity of exposition and its dynamic interpretability. However, these would have demanded excessive prejudgment. Since oneirology is already a highly subjective field, these measures were excluded from this study.

Yet one kind of sleep-dream was noted; the prophetic type of dream with sacerdotal and mystic significance. Both the hysteric and the schizophrenic share a numinous feeling of prophetic power, but in the schizophrenic it eventually assumes gigantic proportions, so that in the end the feelings of high significance and of influence, thought transference, and gradiosity become overtly declared.

The dynamic maneuver the schizophrenic employs seems to be this: He cannot understand or account for his inner mental changes—they are as puzzling to him as the experience of epileptic convulsions with its subjective concomitants is to the very young epileptic child. So he seeks for reference and applicability, and finds explanations which transcend the realm and bonds of reality. Probably this is why so often religiosity enters his psychic scene.

With regard to the body of the study, further mathematical calculations done on the crucial parameters of phantasy, in an attempt to qualify the measurement scales,[5] tended to show that the morphology of phantasy, stereotype, and ego regression in the clinical series might be taken as ordinary clinical measures of intrapsychic pathology (Tables 9 and 10.)

Using these criteria, the obsessive, schizoid, and paranoid character neuroses (Table 9) were halfway between schizophrenia and the normal state or the neuroses in terms of disturbance. But under unusual stress, using gas inhalation, there is a tendency for this middle group (Group II) to behave and react subjectively more like the normals than like the schizophrenics, showing, perhaps, that there is a fundamental intrapsychic defensive barrier against frank psychosis.

TABLE 9.—*Numerical Scale of Severity*

| Groups | Types | Morphology Clinical Series | Ego Regression Clinical Series | Stereotype Exp. Group | Ego Regression Exp. Group | Morphology Exp. Group |
|---|---|---|---|---|---|---|
| I | Schizophrenias | 0 | 0 | 0 | 0 | 0 |
| II | Obsessives | 0.40 | 0.44 | 0.069 | 0.51 | 0.81 |
| | Schizoids | | | 0.57 | 0.64 | |
| | Paranoids | | | 0.88 | 1.05 | |
| III | Neurotics | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Normals | | | | | |
| | Organic illness | | | | | |

Interestingly enough, the ego in the dreams of patients with paranoid character formation regresses much more reluctantly than that of obsessive and schizoid patients, and thus the patient approximates more normal behavior; also, the paranoid in phantasy, despite his fixity of ideas, is less stereotyped both in thinking and in behavior than the obsessive.

TABLE 10.—*Scales of Morphology*

| | Clinical Groups | Experimental Groups |
|---|---|---|
| Nonunitary | 0 | 0 |
| Montage | 0.07 * | 0.55 |
| Unitary | 1.00 | 1.00 |

* 0.07 is not significantly different from 0.

Lastly (Table 10), the category of montage,§ as a measure of medium disturbance of morphology, does not distinguish the three groups clearly under natural clinical conditions. In other words, normal people have this amount of "confusion" in their dream imagery often enough. But when inhalation stress is applied, the frequency of montage distinguishes very clearly the middle category of pathology (Group II, obsessive, paranoid, and schizoid) from the other two, and thus serves as a good measure.

## Summary and Conclusions

The experience of phantasy occurs at a psychosomatic confluence crucial to the onset of schizophrenia. Hence its report gives important clues to the early diagnosis, natural history, prognosis, and residual pathology of schizophrenic illness. Parameters of phantasy may be worked into a measure of the activity of schizophrenia. They are useful and valid even in the complete absence of historical material. They tend to unmask hysterical, anxiety, obsessive, and psychosomatic overlays of the latent schizophrenic pathology.

Following through phantasies, scoring them on a simple protocol, and making a "dream-profile" is a surer method than the scoring of projective techniques, because the dream material is much more easily and cheaply available to the clinical psychiatrist, who, in any case, owes it to himself to know the nature of the patient's imaginative work. Other advantages are that the method of scoring is simpler, humbler, and more appropriate to the basic goal, and that there is no vitiation through task learning, less likelihood of disguise distortion, and more transcultural validity.

What is further needed here is the universal standardized use of a phantasy protocol with a simple scoring device to be statistically perfected, but not rendered beyond the skill of any clinician.

When one remembers how early in life classical obsessive states begin, how recalcitrant they are to radical analytical therapy, their invariable association with childhood autism, and the relation of rumination, perseveration, and stereotype, one is not too surprised to see these stand, in some respects, especially of morphology, nearer the schizophrenias than the neuroses. Dynamically, meticulous clarity, rigid thought control, and a singling out of conscious

§ See definition of montage in Appendix 1.

imaginative functions, are scorched-earth policies of organization against the onslaught of chaos.

Nor was it surprising to see how much better than the active schizophrenias, paranoid states do, especially in thought organization, when one remembers that their systematization and projections exclude the same enemy threatening to crumble the integration of thought and perception. In the subscoring of this Group II, it was interesting to see how they related to each other, and how, for instance, the schizoid group had a facility for regression characteristics.

That the minor neuroses patients were indistinguishable from "normals" is not surprising when we remembered that it is they we cure with psychotherapy alone.

It seems that the pathognomonic nidus of the schizophrenias is the integration and organization of perception of the self and of the surroundings with thinking and feeling. It also seems that the classic disorder begins not at the deepest unconscious level of the mind, but in the next layer, so to speak, the hypnoid layer of twilight between inner and outer reality, when the surrounding world impinges itself on the periphery of the mind.

It might be possible to distinguish a primary psychogenic schizophrenia from a primarily biochemicoorganic type through these parameters, taking morphology of dreaming per se as the main index. Just as conscious clarity may be a defense against unconscious confusion, so vagueness and clouding may be imposed on the ego as a smoke screen, and depersonalization and derealization achieved in consciousness as a death-like defense, abstracting the self from unbearable deprivation and conflict. But I submit that when the psychogenic schizophrenic picture presents itself into consciousness and breaks the barriers between twilight, wake-dreams, and active imagination, the morphology of the sleep-dream remains relatively normal and the dream functions in a dynamic way. It reflects—and the patient's anamnesic substantiates—strains in infancy and childhood, before the possibility of organization of adequate defense, which accounts for such extreme reactions. Its symbols are marshaled in a purposeful way, and their interpretation has therapeutic import. Thus, perception is merely secondarily distorted, whereas if the illness occurs at the level of hallucinogenic action (as in the other types of schizophrenias), perceptions are primarily distorted, the sleep-dream barrier is broken and it loses its function, the morphology becomes fragmental, amorphous, or chaotic, and symbols become remote and profusely archetypal. The only possible dynamism is a desperate effort of the unconscious to explain and organize against the invasion of schizophrenia. Then interpretation of the chaotic sexual spread, of giant phallicisms, of archetypes, is futile, since there is nothing here but a stirring of primordial mud—a disturbance of the ancestral home of Pithecanthropus and Neanderthal.

This work would not have been possible without the skill of Dr. David Sprott, Toronto mathematician. I am also thankful for the help of my colleague, Dr. Hugh McLeod, psychologist.

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## APPENDIX 1

*I. Morphology Parameter Terms*

1. Unitary

A phantasy (sleep, hypnoid, wake-dreams, and activity of imagination in images) mediated by an appropriate and usual

sensory modality (visual, kinesthetic, or auditory), ordered in time, place, and logical sequence of events (peripety), with a beginning and leading to an end or dénouement (lysis). There is a continuity of meaning—both in manifest and in latent content. It has a certain consistency with reality, that is, waking experience. It is stimulated by an easily traceable day residue. It has a certain consistency and congruousness of affect accompanying the sequence of and ordering of the dramatic events—a consistency that is primarily within the phantasy experience, and consistency with what one would or might experience in "reality." Objects (persons, including the self, animals, and inanimate objects) are appropriately represented "as is" in "real life."

2. Montage

Has the same "external-reality" characteristic but to a less marked degree. The distinguishing feature is that the sequence of events is digressive, discursive, undulating about a central theme. It is a story barely held together by a central thread, made up with vignettes. Day residue is barely traceable. Though ordering of time and place is displaced from a central sequence, it is nevertheless maintained in each digressive sequence. The object-representation and sensory modality employed are appropriate.

3. Nonunitary

A phantasy which has lost, progressively, all the "reality characteristics" described above. It may be mediated inappropriately by unusual sensory modalities (touch, smell); it is distorted in time and place. Above all, there is no logical sequence of events, no beginning, no end, and no continuity or meaning. Day residue is hardly traceable, the imagery being autochthonous. Affect is incongruous within the experience and/or with reality. Objects are distorted in their representation, and persons are archaically (primitively) represented. Thus the "reality" is lost in the obscurity of lost association links.

(*a*) Fragmental: The main feature is the broken-up sequence of time, place, identity, and meaning of events.

(*b*) Amorphous: The main feature is the ground-glass-like lack of definition of representations and of actions and a dominance of incongruous emotions.

(*c*) Chaotic: Hazy, brizarre, mixed-up, kaleidoscopic experience of imagery, with no ordering at all and none of the characteristics of unitariness described.

*II. Frequency* (Time-Monitored)

The number of dreams, of dream experiences without content (blanks), and of denials of dream experiences, per period of time (i. e., per week) and per contact with subject, i. e., interview and visit.

*III. Level of Awareness* (Time-Monitored)

The number of sleep-dreams, of twilight (half-sleep and half-wake)-dreams, of wake-dreams, and of image sequences generated on request per one minute, per period of time, i. e., per week, and per contact with subject, i. e., visit.

*IV. Perceptual Pathway*

The sensory modality—visual, auditory, olfactory, gustatory, tactle, kinesthetic—activated in the dream.

*V. Perceptual Pathway*

Somatic Reference.—References to the body of the dreamer and/or another's body, its systems and organs.

Fixed—constant, repeated references in the same terms, to the same part of the body, organ, system, sickness.

Fluctuating—Reference to other organs, etc.

Appropriate—Representations of body and organs "as is."

Remote—Representations " as is not."

*VI. Symbolism:* General

Representation of objects (people, animals, things) other than self.

Appropriate Symbolism—Correct duplicates as in reality.

Medium—Vague experience duplication, but discernible.

Remote—Out of keeping with waking experience.

*VII. Symbolism of the Self*

Grading of representations of the self similar to that of representations of objects.

Appropriate—The subject as (s)he is.

Medium—A vague reference, not directly appropriate.

Remote—Archetypal representation, i. e., primitive, transpersonal.

*VIII. Stereotype*

Repetition within one dream experienced, or in a series of dreams, of exactly the same events, people, places, or partly the same, or not at all the same.

*IX. Day Residue*

Total—The immediately traceable and recognizable relation between the phantasy experience and outer waking, living reality.

Partial—Partly recognizable.

*X. Wish Fulfillment*

Phantasy expressing totally, partially, or not at all what the subject actually desires in living experience.

*XI. Lysis*

The ending, or denouement, of the sequence of events in the phantasy.

Spontaneous—As given by the subject.

By active imagination—As given by subject at the request of the examiner for him to imagine what the end could have been in the dream experience.

Recovery—Happy ending.

Chronicity—Lack of satisfactory resolution, continuance of problem, danger, disability, etc.

Death—Actual or threatened destruction.

All these terms are applicable to the self, and to others, and are scored accordingly.

*XII. Instinctual Drives*: Hostility Spread

The spread and perversion of aggressive drives.

Normal—In keeping with the situation of the dream experience, and actuality of waking experience.

Hostile destructiveness—The unleashing or spread of hostility not in keeping with the situation (or the actuality of waking experience) and directed to an unnecessarily destructive purpose.

Cataclysm—The eruption of murderous blind destruction to the self, others, the world; out of keeping with the dream (and reality) situation, and to no discernible purpose.

*XIII. Instinctual Drive*: Psychosexual Spread

The spread and perversion of sexually erotic drives.

Contained—Appropriate heterosexual or homosexual activity congruous with the phantasy and/or the actuality of waking experience.

Medium—Not quite in keeping with the dream situation and including more deviant sexual acts.

Uncontained—An orgiastic spread of eroticism to several deviant activities, out of keeping with the phantasy situation and the actuality of living experience.

*XIV. Ego Involvement*

The role placing of the self in the relation to the activity of the phantasy.

Involved—Central role (hero or heroine) or role essential to the events of the phantasy.

Partial—In the wings of the stage; more an observer.

Not involved—Isolated, totally observing, or not being there.

*XV. Ego Regression* (see Appendix 2)

The representation of the self at present age level, at past age level, at infantile level, or beyond that is subhuman form.

## APPENDIX 2

Experimental $N_2O$ and $CO_2$ Regression

Name _____ Sex _____ Age _____

Diagnosis _____

First Last

Date Seen _____ Seen _____

1. Dreams # _____ 4. Blanks _____

2. Hypnoid images _____ 5. Denials _____

3. Perceptions _____

1. Morphology

| Dream Morphology * | | | Observed Behavioral Regression ** | | |
|---|---|---|---|---|---|
| Unitary | Montage | Nonunitary | Total | Partial | None |

(Record of Individual Treatment Sessions — 30)

* Morphology takes into account (1) time and space distortion, (2) sensory modality and distortion of its model, (3) sequence and meaning of dream activity, (4) congruity of affect, (5) appropriateness of symbolism, (6) gestalt of entire experience.

** Scale of Behavioral Regression Under $N_2O$ and $CO_2$ Strain

Head Notes:
1. Inhalation; timing; gas constant.
2. Person's pharmacological idiosyncrasy to substance administered—variable.
3. Position: supine *vs.* prone—variable.

| | Criteria | | | | | |
|---|---|---|---|---|---|---|
| Scale of Regression | Total Gestalt Mimetic | Locomotor * System | Autonomic * System | Affect | Aggressive Behavior | Sexual Behavior |
| Total | Like animal or infant; whirling like autist or catatonic | Purposeless; uncoordinated, animal-like | Pupil & sweat changes extreme | Petrified; panic | None | None |
| Partial | Like child | Semipurposeful grasping, groping | Moderate | Fearful, excited | Some | Oral-anal |
| None | At age level | Purpose coordinate | Minimal | Moderate fear & excitement | More purpose | Masturbation and orgastic movements |

* Use of Himwich scale for insulin.

2. Stability

| Stereotype of Expression of Experience | Stereotype of Phantasy * | | | Stereotype of Observed Behavior ** | | |
|---|---|---|---|---|---|---|
| | Total | Partial | None | Total | Partial | None |

(Record of Individual Treatment Sessions — 30)

* Persistent recurrence of image or thought and of expression of the entire experience in the same words.
** Persistent recurrence of patterns of movement and posthypnotic behaviour.

3. Ego Regression

| Ego Regression in Phantasy * | | | Observed Behavioral Regression | | |
|---|---|---|---|---|---|
| Ego at Age Level | Partial Regression | Total Regression of Infantile Nonego | Ego at Age Level | Partial Regression | Total Regression |

(Record of Individual Treatment Sessions — 30)

At age level = seeing self "as is." Partial regression = to childhood. Total regression = infancy and animal-like.

# The SHP Test—an Aid in the Detection and Measurement of Depression

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From the point of view of exact diagnosis perhaps no psychiatric condition is as unsatisfactory as depression. It can be a symptom or a diagnosis. It is recognized as a normal mood. There is even considerable variation in the diagnostic use of the term. The diagnoses manic-depressive psychosis, involutional depression, reactive depression, neurotic depression, etc., are still widely used, even though they no longer have official standing. To add to the semantic confusion, it must be admitted that the diagnosis of depression in psychiatry is still largely impressionistic and lacks precision. The psychiatrist bases his clinical opinion on a careful evaluation of the history, the complaints, the appearance of the patient, the course under observation or treatment, psychological tests, and intuition.

As bad as this state of affairs is, the diagnosis of suicide risk is even worse. Here even educated guessing it notoriously fallible, and although there exists a large literature on the subject and many studies that purport to explain and identify the suicide and potential suicide, there is great disagreement among these. The need for exact physiological tests for the purpose of detecting depression has long been recognized, and many attempts have been made to find such.[2] Some promising leads have been found but have not stood up under further study, or have been prematurely abandoned. The present study is an extension of one of these which seemed to show more than average promise.

Twenty years ago, Strongin and Hinsie[4] studied the salivary secretion rate of various types of psychiatric patients, using a Lashley suction cup over the parotid duct. They demonstrated a marked decrease in secretion rate in depressed patients and an excess secretion in schizophrenics. Their average normal rate was 0.07 cc/min., while that for schizophrenics was 0.38 and the mean for depressed patients was 0.005! The ranges were, respectively, 0.02-0.15, 0.23-0.74, and 0.001-0.01, so that this test would seem to discriminate precisely the three groups. In a further study of salivary secretion rate in patients undergoing insulin therapy they presented material that seemed to show that this rate could vary in a regular and predictable way.[5] It has been shown that salivary secretion is affected by emotional state.[6,7]

In view of these encouraging results, it is astonishing that this technique has been allowed to languish without further investigation or any large-scale testing. A possible explanation is that the technique, though not basically difficult, expensive, or harmful, was perhaps too cumbersome and time-consuming. It seemed possible to devise an easier, quicker method for determining the salivary secretory rate. Collecting the saliva on cotton rolls for this purpose has been done by various investigators, among them Poth,[3] and was suggested to me by Dr. I. W. Scopp, chief of dental service of the New York Veterans Administration Hospital. Accordingly, this was attempted on a preliminary basis and found satisfactory, as it discriminated between a group of 13 depressed patients and 7 controls at the 0.01 level of confidence. Large-scale testing was then instituted in an attempt to work out the basic parameters of the test. It quickly

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was nicknamed the "saliva," "sputum," or "spit" test by patients and staff, and to forestall this it was christened the SHP tests, for Strongin, Hinsie, and Peck.

## Technique

Three Hall dental rolls of standard 2-in. length and showing little variation in weight are used in each test. One is placed sublingually and the other two buccally bilaterally. These were left in place for exactly two minutes by a stop watch, then placed in a relatively airtight wide-mouth, 210 ml., screw-top bottle. Saliva evaporates from such bottles at the rate of 7 mg. an hour. Each roll was weighed individually as soon after collecting as possible, and the average of the three determinations was taken as the test reading. A correction was added to this according to the amount of time elapsed between collection and weighing. A Mettler precision balance, Type K7, 5, or 4T was used for the weighing. This gave readings accurate to the nearest hundredth of a gram.

An edge-punch card was kept on each test. On this were recorded all data which might conceivably affect the test, such as date, age, weight, race, sex, time test was taken, time rolls were weighed, time of last food, alcohol, coffee, tea, chewing gum, smoking, presence of fever or dentures, drugs being taken, and a rating of degree of depression made by the staff psychiatrist. This was in terms of 0 for no depression, 1 for some, 3 for a great deal, and 2 for anything between 1 and 3. Depression was thought of generally as a mood or symptom and would be scored even though the diagnosis was not depression, but schizophrenia, neurosis, or other condition. Therefore the results would not be exactly comparable to those of Strongin and Hinsie, who felt their data applied only to manic-depressive, depressed patients.

The various parameters were worked out in two ways, either statistically or experimentally, depending on which was most practicable. Where possible the comparison between depressed and nondepressed groups was kept as the columns, while the other parameter being measured was assigned to the rows. In general, in the interests of orthogonality, the test groups were kept equal. Cards from the larger group were picked at random to achieve this.

TABLE 1.—*Influence of Sex on SHP*

| Sex | Conditions: Control | Conditions: Depressed | Sex Mean |
|---|---|---|---|
| M | 1,703 | 941 | |
| | 1,087 | 1,142 | |
| | 1,830 | 859 | |
| | 1,216 | 967 | |
| | 1,114 | 732 | |
| | 2,130 | 868 | |
| | 1,031 | 840 | |
| | 1,255 | 778 | |
| Mean | 1,421 | 891 | 1,156 |
| F | 1,143 | 930 | |
| | 2,577 | 1,240 | |
| | 737 | 1,133 | |
| | 1,010 | 1,520 | |
| | 712 | 865 | |
| | 1,680 | 982 | |
| | 1,180 | 711 | |
| | 1,285 | 967 | |
| Mean | 1,290 | 1,043 | 1,167 |
| Conditions mean | 1,356 | 967 | 1,161 |

Analysis of Variance

| Source | $Sx^2$ | *d.f.* | *M. S.* | *F* | Sig. |
|---|---|---|---|---|---|
| Conditions | 1207072 | 1 | 1207072 | 7.88 | 0.01 |
| Sexes | 1004 | 1 | 1004 | 0.01 | n. s. |
| Conditions×Sex | 160039 | 1 | 160039 | 1.04 | n. s. |
| Error | 4289552 | 28 | 153198 | | |
| Total | 5657667 | 31 | | | |

## Results

Table 1 gives the test scores, in milligrams, for the two sexes. The difference in means between depressed and nondepressed patients can be seen to be significantly different, whereas that for the sexes is not.

Table 2 gives the influence of age on the test in the same manner. Age does not significantly affect the test, but it is evident that the difference between the means for depressed and for nondepressed patients is lost for those in the age group under 19. This is because most of this group were children, who were found to have a much higher salivary secretory rate.*

Table 3 shows the effect of race on the SHP test. Here there is a significant difference between white persons and Negroes, as well as the significant difference between depressed and nondepressed patients, with Negroes giving consistently higher readings. Thus the diagnostic differential remains.

Table 4, though somewhat scanty, shows fairly definitely that body weight is not a factor that affects the test.

* Dr. Arthur Zitrin, Director, Psychiatric Division of Bellevue Hospital, permitted me to test the adolescents, women, and children in this series.

TABLE 2.—*Influence of Age on SHP*

| Age, Yr. | Conditions: Control | Conditions: Depressed | Ages Mean |
|---|---|---|---|
| 60 and over | 887 | 1,085 | |
| | 857 | 1,232 | |
| | 1,085 | 732 | |
| | 1,217 | 885 | |
| | 2,100 | 907 | |
| | 864 | 937 | |
| Mean | 1,168 | 963 | 1,066 |
| 40 to 59 | 1,003 | 930 | |
| | 1,830 | 1,132 | |
| | 1,680 | 865 | |
| | 1,255 | 967 | |
| | 737 | 808 | |
| | 2,577 | 780 | |
| Mean | 1,514 | 914 | 1,214 |
| 20 to 39 | 1,143 | 987 | |
| | 1,010 | 778 | |
| | 2,130 | 859 | |
| | 1,285 | 908 | |
| | 1,216 | 896 | |
| | 1,180 | 1,142 | |
| Mean | 1,327 | 928 | 1,128 |
| 19 and under | 1,427 | 1,574 | |
| | 1,172 | 1,266 | |
| | 1,380 | 1,520 | |
| | 1,263 | 1,263 | |
| | 1,755 | 1,779 | |
| | 1,356 | 1,282 | |
| Mean | 1,392 | 1,447 | 1,420 |
| Conditions mean | 1,350 | 1,063 | 1,207 |

Analysis of Variance

| Source | $Sx^2$ | *d.f.* | *M. S.* | *F* | Sig. |
|---|---|---|---|---|---|
| Conditions | 990440 | 1 | 990440 | 8.11 | 0.01 |
| Ages | 858588 | 3 | 286196 | 2.34 | n. s. |
| Conditions×Ages | 702782 | 3 | 234261 | 1.92 | n. s. |
| Error | 4885810 | 40 | 122145 | | |
| Total | 7437620 | 47 | | | |

TABLE 3.—*Influence of Race on SHP*

| Race | Conditions: Control | Conditions: Depressed | Races Mean |
|---|---|---|---|
| Negro | 1,867 | 919 | |
| | 956 | 998 | |
| | 2,577 | 982 | |
| | 1,755 | 884 | |
| | 1,659 | 1,017 | |
| | 1,263 | 845 | |
| Mean | 1,679 | 941 | 1,310 |
| White | 776 | 770 | |
| | 1,010 | 789 | |
| | 1,770 | 780 | |
| | 1,285 | 827 | |
| | 1,223 | 967 | |
| | 1,114 | 840 | |
| Mean | 1,196 | 829 | 1,013 |
| Conditions mean | 1,438 | 885 | 1,161 |

Analysis of Variance

| Source | $Sx^2$ | *d.f.* | *M. S.* | *F* | Sig. |
|---|---|---|---|---|---|
| Conditions | 1835407 | 1 | 1835407 | 17.07 | 0.01 |
| Races | 531335 | 1 | 531335 | 4.94 | 0.05 |
| Conditions×Races | 206648 | 1 | 206648 | 1.92 | n. s. |
| Error | 2149858 | 20 | 107493 | | |
| Total | 4723248 | 23 | | | |

Table 5 gives the data on 10 febrile patients collected from the medical wards compared with a random group of controls. It is obvious that fever lowers the SHP reading and must be taken into consideration in interpreting the results.

Table 6 is a statistical study of tests in which patients had smoked at varying times before the test. This is not as satisfactory as an experimental demonstration, but does not seem to show any effect of smoking on the test readings.

Table 7 is an experiment to show whether chewing gum is a factor that affects the test. Although there is no statistically significant difference between the readings of the group before and after chewing gum, inspection of the readings shows most of the differences to be quite large; therefore the chewing of gum should be taken into consideration in evaluating the results, and the test should be done at a time when gum has not been chewed for some time.

Table 8 gives the data for a group of depressed patients who were studied at intervals throughout the 24 hours to determine the diurnal and prandial variations in the test. The before- and after-meals difference is not significant, but there is a definite tendency for the evening scores to become greater and the *t*-value for the difference between scores for the 12 hours before and after noon is 12.73 (Table 9). The optimum time for taking the test would be midmorning or midafternoon, depending on whether it is desired to catch the patient

TABLE 4.—*Influence of Weight on SHP*

| Weight, Lb. | | Conditions: Control | Conditions: Depressed | Weights Mean |
|---|---|---|---|---|
| Over 200 | | 2,250 | 982 | |
| | | 1,457 | 896 | |
| | Mean | 1,853 | 939 | 1,396 |
| 175 to 199 | | 2,130 | 795 | |
| | | 1,770 | 808 | |
| | Mean | 1,950 | 801 | 1,376 |
| 150 to 174 | | 1,216 | 780 | |
| | | 1,003 | 868 | |
| | Mean | 1,109 | 824 | 967 |
| 125 to 149 | | 1,680 | 840 | |
| | | 1,010 | 967 | |
| | Mean | 1,345 | 903 | 1,124 |
| 100 to 124 | | 1,180 | 865 | |
| | | 1,143 | 881 | |
| | Mean | 1,161 | 873 | 1,017 |
| Less than 99 | | 1,356 | 1,266 | |
| | | 1,659 | 1,263 | |
| | Mean | 1,507 | 1,265 | 1,386 |
| Conditions mean | | 1,488 | 934 | 1,211 |

Analysis of Variance

| Source | $Sx^2$ | *d.f.* | *M. S.* | *F* | Sig. |
|---|---|---|---|---|---|
| Conditions | 1838727 | 1 | 1838727 | 32.03 | 0.01 |
| Weights | 787225 | 5 | 157445 | 2.74 | n. s. |
| Conditions × Weights | 735356 | 5 | 147071 | 2.56 | n. s. |
| Error | 688800 | 12 | 57400 | | |
| Total | 4050108 | 23 | | | |

TABLE 5.—*Effect of Fever on SHP*

| | Febrile | Afebrile |
|---|---|---|
| | 803 | 887 |
| | 715 | 1,085 |
| | 747 | 2,100 |
| | 890 | 1,003 |
| | 738 | 1,680 |
| | 1,050 | 1,143 |
| | 756 | 2,130 |
| | 1,072 | 1,216 |
| | 730 | 1,180 |
| | 1,123 | 1,427 |
| Mean | 862 | 1,385 |
| $t$=3.51 (0.01) | | |

at the bottom or the peak of his cycle. It can be seen also that there are 4 of the 10 patients who do not show this variation to any degree, and their scores are differentiated from the other 6 at a $t$ of 6.07 (0.01). No clinical reason for this finding has been discovered, so that its exact significance, if any, awaits further study. It is possible it may be related to the subjective diurnal variation reported by some patients.

Table 10 gives the frequency distribution for the entire body of data divided into the categories of 0, 1, 2, and 3 for degree of depression, as defined above. The frequencies in Groups 1, 2, and 3 are approximately equal, thus casting some doubt on the validity of the ratings, since the distribution, assuming it to be normal, should

TABLE 6.—*Influence of Smoking on SHP*

| | No Information | Do Not Smoke | Minutes Before Test: Immediately Before Test | 1-5 | 6-15 | 16-30 | 31 and over |
|---|---|---|---|---|---|---|---|
| | 904 | 1,003 | 845 | 780 | 778 | 1,183 | 926 |
| | 1,462 | 1,116 | 1,770 | 1,168 | 830 | 2,130 | 956 |
| | 1,178 | 1,242 | 1,330 | 789 | 1,223 | 1,240 | 712 |
| | 1,079 | 732 | 1,216 | 1,143 | 800 | 922 | 865 |
| | 859 | 1,972 | 1,010 | 1,285 | 1,380 | 840 | 1,520 |
| | 1,167 | 1,013 | 1,138 | 797 | 980 | 660 | 1,133 |
| Mean | 1,108.2 | 1,179.7 | 1,218.2 | 993.7 | 998.5 | 1,162.5 | 1,018.7 |

Analysis of Variance

| Source | $Sx^2$ | *d.f.* | *M. S.* | *F* | Sig. |
|---|---|---|---|---|---|
| Groups | 314677 | 6 | 52446 | 0.46 | n. s. |
| Error | 3967227 | 35 | 113349 | | |
| Total | 4281904 | 41 | | | |

TABLE 7.—*Experiment to Demonstrate Effect of Chewing Gum on SHP Test*

| Patient | Before | After | *d* |
|---|---|---|---|
| 1 | 883 | 1,129 | 246 |
| 2 | 837 | 727 | —110 |
| 3 | 872 | 1,160 | 288 |
| 4 | 1,255 | 1,107 | —143 |
| 5 | 818 | 790 | —116 |
| 6 | 777 | 1,007 | 230 |
| 7 | 723 | 704 | —19 |
| 8 | 1,160 | 1,382 | 222 |
| 9 | 963 | 1,383 | 420 |

Sign test, N=9, $P$=0.500 (n. s.)

certainty, it appears as though catatonic schizophrenics may have consistently high readings.

## Comment

It is certain from the data that there is a consistent and good correlation between clinical depression and a lowered rate of salivary secretion as measured by the SHP test. No attempt has been made to establish a cut-off point between depressed and non-depressed groups, as the overlap between

TABLE 8.—*Diurnal and Prandial Variation in SHP*

| | Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mid Morning | Before Lunch | After Lunch | Mid Afternoon | Before Supper | After Supper | Late Evening | Early Morning | Before Breakfast | After Breakfast | |
| | 10:06 to | 11:53 to | 1:00 to | 2:37 to | 4:47 to | 6:19 to | 10:25 to | 2:59 to | 7:08 to | 8:32 to | |
| Patient | 10:45 | 12:10 | 1:12 | 2:52 | 5:13 | 6:35 | 10:39 | 3:13 | 7:23 | 8:46 | Mean |
| 1 | 1,356 | 1,456 | 1,117 | 1,098 | 1,999 | 1,645 | 1,670 | 1,435 | 1,230 | 1,090 | 1,410 |
| 2 | 787 | 977 | 927 | 912 | 690 | 787 | 813 | 852 | 929 | 849 | 852 |
| 3 | 801 | 875 | 970 | 905 | 1,353 | 1,175 | 1,402 | 963 | 920 | 982 | 1,035 |
| 4 | 806 | 847 | 840 | 922 | 776 | 889 | 1,527 | 667 | 752 | 829 | 885 |
| 5 | 831 | 1,010 | 873 | 862 | 823 | 1,070 | 969 | 829 | 763 | 829 | 886 |
| 6 | 960 | 897 | 1,337 | 958 | 1,027 | 1,050 | 905 | 849 | 827 | 840 | 965 |
| 7 | 745 | 761 | 1,013 | 795 | 2,692 | 829 | 820 | 795 | 837 | 867 | 1,015 |
| 8 | 744 | 850 | 833 | 762 | 977 | 879 | 853 | 772 | 812 | 900 | 838 |
| 9 | 797 | 930 | 983 | 868 | 1,199 | 980 | 979 | 859 | 750 | 797 | 914 |
| 10 | 664 | 1,060 | 953 | 942 | 883 | 763 | 730 | 755 | 829 | 735 | 831 |
| Mean | 849 | 966 | 985 | 902 | 1,242 | 1,007 | 1,067 | 878 | 865 | 872 | 963 |

Analysis of Variance

| Source | $S_{X^2}$ | *d.f.* | *M. S.* | *F* | Sig. |
|---|---|---|---|---|---|
| Times | 1328262 | 9 | 147585 | 1.93 | 0.05 |
| Error | 6885107 | 90 | 76501 | | |
| Total | 8213369 | 99 | | | |

be something like 18, 69, and 18. However, we have no better way of measuring depression; so it was necessary to be content with this. The between-group variance continues to be significant, and the regression is roughly linear, at least through Group 2, at which point it moves upward to make a curvilinear distribution. Part of the higher mean of Group 3 is due to the several very high readings in this group. These high readings occurred in catatonic schizophrenics, and though there are not enough data available at present to say so with

TABLE 9.—*Changes in Morning and Evening SHP Readings*

| Patient | Morning | Evening | *d* |
|---|---|---|---|
| 1 | 1,313 | 1,506 | 193 |
| 2 | 879 | 826 | 53 |
| 3 | 908 | 1,161 | 253 |
| 4 | 780 | 991 | 211 |
| 5 | 852 | 919 | 67 |
| 6 | 875 | 1,055 | 180 |
| 7 | 801 | 1,230 | 429 |
| 8 | 816 | 861 | 45 |
| 9 | 826 | 1,002 | 176 |
| 10 | 809 | 854 | 45 |
| Mean | 886 | 1,040 | 165 |

$t$=12.73 (0.01)

TABLE 10.—*Correlation of SHP and Clinical Ratings of Depression*

| | Clinical Rating | | | | |
|---|---|---|---|---|---|
| SHP, Mg. | 0 | 1 | 2 | 3 | Total |
| 2,801-2,900 | — | — | — | 1 | 1 |
| 2,701-2,800 | — | — | — | — | |
| 2,601-2,700 | — | — | — | — | |
| 2,501-2,600 | 1 | — | — | — | 1 |
| 2,401-2,500 | — | — | — | — | |
| 2,301-2,400 | 1 | — | — | — | 1 |
| 2,201-2,300 | 1 | — | — | — | 1 |
| 2,101-2,200 | 2 | — | — | — | 2 |
| 2,001-2,100 | — | 1 | — | — | 1 |
| 1,901-2,000 | 1 | 1 | — | 1 | 3 |
| 1,801-1,900 | 2 | — | — | — | 2 |
| 1,701-1,800 | 5 | 1 | — | — | 6 |
| 1,601-1,700 | 2 | 2 | — | — | 4 |
| 1,501-1,600 | — | 1 | 5 | — | 6 |
| 1,401-1,500 | 6 | 3 | — | 1 | 10 |
| 1,301-1,400 | 4 | 2 | — | — | 6 |
| 1,201-1,300 | 11 | 1 | 1 | 5 | 18 |
| 1,101-1,200 | 10 | 4 | 2 | 3 | 19 |
| 1,001-1,100 | 10 | 3 | 3 | 3 | 19 |
| 901-1,000 | 8 | 7 | 8 | 2 | 25 |
| 801- 900 | 7 | 4 | 9 | 6 | 26 |
| 701- 800 | 10 | 7 | 9 | 6 | 32 |
| 601- 700 | 1 | 1 | 2 | 0 | 4 |
| | — | — | — | — | — |
| N | 82 | 38 | 39 | 28 | 187 |
| Mean | 1,227 | 1,123 | 975 | 1,094 | 1,134 |
| *S. D.* | 406 | 351 | 257 | 426 | 386 |

Analysis of Variance

| Source | $S\chi^2$ | *d.f.* | *M. S.* | *F* | Sig. |
|---|---|---|---|---|---|
| Clinical groups | 3080204 | 3 | 1026735 | 4.15 | (0.01) |
| Error | 45264637 | 183 | 247348 | | |
| Total | 48344841 | 186 | | | |

the two groups is so large that a great deal of error would be involved in the process. At the present time no judgment can be made about any one case from the test alone, but with further refinement it may become possible to do this. Judicious use of the test, taking into consideration such factors as may affect it, such as race, age, fever, etc., may make it a valuable addition to the psychiatric armamentarium. Perhaps it may come to be used in much the same way as a white cell count or temperature in clinical medicine, of no value in itself, but of great value when used in conjunction with other facts.

Much remains to be done. No systematic study has been made so far of the effects of medications on the test, but there are hints that antihistamines and chlorpromazine depress the secretion. Readings at various points before, during, and after electroconvulsive therapy are indicated. Intraindividual correlations between the readings and ratings of degree of depression are very much in order and have already been started, but will take some time to finish. Correlations with other physiological and psychological indices that purport to be associated with depression must be done.

No physiological or psychological theory about the nature of the relation between depressed salivary secretion and depression is being offered. It is probable that it indicates merely a decreased autonomic activity, and that such exists has been known for some time.[1] At present it is enough to say of the SHP test that it can help detect depression and perhaps also measure its degree. Being a purely physiological test, it is not subject to human judgmental error. It should, therefore, fill a much needed spot in scientific psychiatry, and it is hoped that it will be studied and used on a wider scale, so that a large body of facts can be developed about it.

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# Evaluation of Certain Drugs in Geriatric Patients

*Effects of Chlorpromazine, Reserpine, Pentylenetetrazol U. S. P., and Placebo on Eighty-Four Female Geriatric Patients in a State Hospital*

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Coincident with the increasing longevity of the general population, physicians are faced with the care of an increasing number of elderly patients with mental and emotional problems which are, in part, peculiar to the period of senescence. The problems of geriatric mental illness and senility are especially profound for the state hospitals.

In Minnesota in 1940 approximately 8% of the general population were 65 years of age or older. By 1955 an estimated 10% of the general population fell in the same age category. Whereas in 1940, 0.8% of persons more than 65 years of age in the state were in mental hospitals, by the year 1954-1955, 1.4% were in such institutions. Of all patients in the Minnesota state mental hospitals today, 37% are 65 years of age or older.[1] Similar figures are available on a nationwide scale.[2,3] In the face of this growing problem, the importance of careful and objective assessment of the relative merits of various proposed therapeutic measures is readily apparent.

The development of the so-called tranquilizing drugs has evoked renewed enthusiasm for pharmacotherapy in mental hospitals. The currently prevailing impression among workers in the field is that these drugs play a significant role as therapeutic agents in mental illness. However, as expressed repeatedly at the Conference on the Evaluation of Pharmacotherapy in Mental Illness held in Washington, D. C., in September, 1956, the effects of drugs, the beneficial nature of these effects, and comparison of the effects of drugs with the effects of other therapeutic methods and agents still await clarification. The statements of Bleuler and Stoll[4] published in 1955 are still pertinent:

> Our period of observation, since the introduction of these treatments [reserpine and chlorpromazine], is much too short to answer this question on the basis of convincing statistical studies. It was many years before we could say, with any degree of certainty, whether or not the older shock therapies were truly efficient therapeutic weapons. Therefore, we are not about to begin having illusions about our first experiences with these new medications. We have not as yet definitely discovered what actual advances and disadvantages chlorpromazine and reserpine have over the older therapies.

*Methodology.*—Eighty patients from the women's geriatrics unit of the Rochester State Hospital were selected for study on the basis of diagnosis and age (65 years or more) at the time of onset of illness. Clinical diagnostic categories included chronic brain syndrome associated with senile brain disease or associated with cerebral arterio-

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Section of Psychiatry, Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minn., is a part of the Graduate School of the University of Minnesota.

Abridgment of thesis submitted by Dr. Robinson to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science in Psychiatry.

Drugs were provided by Smith, Kline & French Laboratories, Ciba Pharmaceutical Products, Inc., and Billhuber-Knoll Corporation. Howard P. Rome, M.D. (Mayo Clinic) assisted in formulating and reviewing the project. Magnus C. Petersen, M.D. (Superintendent, Rochester State Hospital) helped in planning and conducting the study.

sclerosis. Problems inherent in establishing these diagnoses clinically have been the subject of a comprehensive report by Strassman and Asekoff.[5] Although eight additional patients were selected as replacements, only 84 completed at least one six-week medication period. The mean age of the 84 patients was 81 years. Individual ages varied from 65 to 100 years.

### Categorization of Patients

Members of the test group were individually classified according to a behavioral grouping used previously by Sainz [6] in his evaluation of the response of geriatric patients to reserpine.

Group 1 included patients whose response to their basic problem, either organic deterioration or psychologic stress or both, could be described best as *centrifugal;* that is, the symptom expression of their problem was away from self and onto their environment. These patients demonstrated predominant symptoms of irritability, quarrelsomeness, apprehension, and overdependency, singly or in varying combinations.

Group 2 included patients whose response to their basic problem could be considered as *centripetal* in the same frame of reference; for example, these patients turned away from their environment with predominant symptoms of depression, negativism, apathy, and withdrawal, singly or in varying combinations.

Group 3 included patients who showed the characteristic symptoms associated with organic brain damage without a significant degree of emotional response of either a centrifugal or a centripetal nature. These patients showed predominantly impairment of memory, judgment, orientation, comprehension, and affect.

The groups are neither clearly defined nor nosological in a usual sense, but they were used in this study as a pragmatic device to assess the results of medication. When symptoms of more than one category were present, the patient was classified according to the most prominent symptoms observed. The groupings are not fixed or static, for centrifugal and centripetal behavioral reactions present on the patient's admission often subside in response to the routine of hospital life and leave only the symptoms of simple deterioration.

This behavioral grouping was made to facilitate evaluation of the clinical efficacy of the drugs. Grouping according to the standard diagnostic nomenclature of chronic brain syndrome with senile brain disease, and so forth, might have clouded results since clinical differentiation of these conditions is often impossible. Also of more importance to the problem of rehabilitation or prolonged nursing care or both is the behavioral reaction pattern of the patient.

Since the majority of patients in this study fell into Group 3, these patients were graded according to the degree of deterioration on a basis of 1 to 4, that is, from slight to severe deterioration.

Grade 1 included patients who showed preservation of many areas of intellectual function with minimal confusion and lability of emotions and with spotty impairment of judgment, memory, and orientation. They were fairly self-sufficient in a simple hospital environment.

Grade 4 included those patients requiring intensive nursing care regarding the bare essentials of living. Most of these patients were untidy and needed help in dressing and undressing; some required feeding, and, in general, they were kept separated from the rest of the geriatric patients in the building. They were disoriented in time and place, and some were unable to give their names.

Grades 2 and 3 included intermediate levels of deterioration. Obviously, these criteria overlap considerably from grade to grade.

On the basis of these categorizations, four matched groups were formed to receive chlorpromazine, reserpine, pentylenetetrazol U. S. P. (Metrazol), or a placebo.

### Administration of Medication

After an initial two-week control period, there were three six-week medication pe-

riods. At the end of each six-week period each patient's responses were summarized. If symptomatic improvement had occurred, the patient was continued on the same regimen to determine the possibility of further improvement, maintenance of improvement, or deterioration. If the patient did not show improvement or seemed worse, a different drug was administered for the next six-week period. However, to provide a control group, patients started on placebo were maintained on it for the entire 18 weeks of the study.

All medication was given orally in pink capsules of uniform size and appearance. Extreme care was taken to insure that the medication was actually ingested. The capsules were provided in bottles labeled only with a number. The nature of the medication was known only to the medical director (M. C. P.), who adjusted doses but had no part in the clinical evaluation of the medications.

At the end of the two-week control period, the medical director was given symptom check sheets containing a brief résumé of each patient's history and progress to date; her age, weight, and blood pressure, and a list of symptoms which might be confused with subsequent effects of medication. From this information, the initial dosage of medication was adjusted to the individual patient. Biweekly adjustments were made during medication periods. We have felt it to be less than desirable to administer standard doses to one and all in a study.

At the termination of each six-week medication period, I prepared a summary of the findings and rated the patients as "improved," "slightly improved," "unchanged," "slightly worse," or "worse," as compared with the control period base line. This information was used by the medical director in the assignment of a drug schedule for the subsequent medication period.

The dosage of the drugs used varied considerably according to the response of the individual patient.

**Evaluation of Patients**

The evaluation proceeded by the following three approaches:

1. *Psychiatric Evaluation.*—I was in the ward daily to observe the characteristically fluctuant mental status of patients in the senium. Twice weekly I reviewed the symptom check list for each patient and noted her general status and her morning blood pressure.

At the beginning and end of the two-week control period, and also at the end of the fourth and sixth weeks of each medication period, a complete examination of mental status was carried out. In an attempt to standardize and quantify these observations, a form was devised in which each response could be recorded qualitatively, as well as graded numerically. Into this form were incorporated those elements of the Revised Malamud Scale [7] which were pertinent to the experimental group. I conducted these examinations in my office in the geriatrics building approximately at the same time of day for each successive interview.

2. *Evaluation by Nurses and Psychiatric Aides.*—At the time of my biweekly visit to the patients on the ward, the accompanying nurse emphasized elements of behavior not readily observable by me, such as sleep pattern, details of toilet, eating, and so forth. Nurses were instructed to report immediately any disturbing complications. In addition to the cumulative reports made to me while making rounds, the ward personnel completed a behavior rating scale for each patient once during the control period and at the end of each medication period. This rating scale was an adapted form of the L. M. Fergus-Falls Behavior Rating Scale primarily for use in the geriatric population. In each category of ward behavior, the patient was graded numerically from 1 to 5.

3. *Psychometric Testing.*—Psychometric testing was carried out at the beginning and end of the two-week control period and at the end of the fourth and sixth weeks of each medication period. These tests were

administered by a staff psychologist. Each patient was presented with the Partington Pathways,[8] and the first six of the series of pathways were used. The test was concluded when there was failure. When the patient was unable to perform the simplest of these tests, she was presented with the Seguin Form Board.[9] The quality of performance was measured by the complexity of the task performed, as well as the time required to perform each of the tests.

### Grading of Responses

On the basis of the accumulated data, each patient's responses were graded as "improved," "slightly improved," "unchanged," "slightly worse," or "worse" when compared with the base line level of functioning of the control period. In general, the criteria of improvement were based on (1) increase of social responsiveness, as observed in grooming and interpersonal relations, such as response to fellow patients, nurses, aides, physicians, and family; (2) intellectual improvement, reflected in memory, orientation, perception, attention, judgment, and quality of performance of psychometric tests; (3) stream and content of thought, and (4) appropriateness of mood.

Since it was impossible quantitatively to weigh these fluctuating factors, the final judgment in assessing the patient's responses was necessarily a clinical decision based on the accumulated data.

### Results

Chlorpromazine, reserpine, and pentylenetetrazol did not produce favorable results in appreciable numbers of the experimental population. However, the only patients who showed more than slight improvement during the study were patients who were receiving one of the active medications. Such improvement occurred in only seven patients and was sustained in only four patients. None was improved sufficiently for consideration of dismissal from the hospital. One of the four patients received reserpine; one, pentylenetetrazol, and two, chlorpromazine. It is apparent that no conclusion can be made relative to the comparable efficacy of these three drugs on this basis alone. When slight improvement in patients is considered along with improvement, the results obtained with drugs are insignificantly different from results observed with administration of placebo.

Contrariwise, a tendency to deteriorate to a lower level of functioning was observed more frequently among patients receiving active medication than among patients receiving placebo. This difference is even more striking when responses to initial medication only are considered. In this way mixed effects from consecutively different drugs are avoided. However, the difference in rate was statistically significant only in the cases in which chlorpromazine was given; 34.7% of patients who received this drug became worse or slightly worse. This is in contrast to a corresponding value of 5.3% for patients receiving placebo.

With reference to questions concerning the length of medication periods necessary for beneficial effects, it is worthy of note that in patients who were maintained on the same medication because of some degree of improvement, there were eight who regressed from an "improved" rating to a condition so close to the baseline that medication was changed. Their improvement was considered to be *unsustained*.

The changes observed did not seem to be significantly affected by age variability, although subgroups by age were small in number. The mean age of patients graded as improved was 79 (with a spread of 77 to 83 years), while the mean age of all patients showing any degree of improvement was 83 (with a spread of 74 to 93 years). Likewise, successes and failures did not relate to the psychiatric categorization used in the study. Again, the subgroups were small in number.

It may be assumed that patients in Group 3 categorized as having Grade 1 deterioration would have less extensive irreparable brain damage than those patients

showing Grade 4 deterioration. Consequently, patients with Grade 1 deterioration might be expected to show more improvement than those with Grade 4 deterioration if treatment were effective.

In this study, of the four patients in Group 3 with Grade 1 deterioration, three (75%) showed slight improvement. Only four (18%) of the 22 patients with Grade 4 deterioration showed any improvement. This degree of difference is not likely to occur by chance of sampling. However, one of the slightly improved patients with Grade 1 deterioration had received a placebo. If this patient is excluded, the difference in improvement rate is no longer statistically significant. More successful use of these drugs might possibly be expected in outpatient care of early senile mental problems, although this is merely supposition and not validated observation.

*Pentylenetetrazol* (Metrazol) (49 Patients).

Conflicting reports are to be found in the literature regarding the efficacy of pentylenetetrazol in the senile patient. Many favorable reports have been based largely on subjective evaluations without the incorporation of double-blind or control technique. Only a few reports show favorable or questionably beneficial results. These reports have been derived from more carefully controlled studies.

In the present study, the mean age of patients was 81, which is older than the mean age in most studies on the use of pentylenetetrazol reported to the time of this study. Also, no outpatients were included in this project. Therefore, in the patients studied the process of senile deterioration in general may have been more advanced.

The dosage of pentylenetetrazol advised [10] is 0.2 gm. four times daily. The dosage used in this study did not average quite as high. Convulsions resulted in two patients when given daily doses of 0.8 and 1.2 gm., respectively. A third patient (given 0.5 mg. daily) had subjective muscle jerking, which subsided when the daily dose was reduced to 0.3 gm. The only patient who was rated as "improved" received 0.4 gm. of pentylenetetrazol daily.

Each patient who received pentylenetetrazol lost an average of 2.6 lb. during each six-week period that the drug was given; patients in the placebo group lost an average of 1 lb. in the same period. Dyspnea and diarrhea occurred temporarily in 6.1% of the patients receiving pentylenetetrazol.

*Reserpine* (53 Patients).—The literature contains few comparable studies concerning the efficacy of reserpine in the senile patient. The results obtained by Sainz [6] in patients whose condition was comparable to that of patients in Groups 1 and 2 were excellent, as contrasted with the relatively poor results of this study. However, Sainz used much larger doses, reaching a maximum of 2.0 mg. per kilogram of body weight. The average dose in this series was 0.93 mg. per day per patient, with a maximal daily dose of 3.0 mg. Also in Sainz' study the mean age of patients was younger than that of patients in this study, and many of the patients were outpatients, implying that there may have been less extensive organic damage. Differences in methodology, such as the use or absence of parallel control series and double-blind techniques, make difficult the comparison of results of many other reports with the present study.

Side-effects encountered on administration of reserpine were as follows: lethargy (54% of patients), skin reactions (questionable in 2 patients), infrequent nasal stuffiness, shivering, dryness of mouth, sialorrhea, intestinal hypermotility (11.3% of patients), extrapyramidal signs (5.6% of patients), and occasional pallor. These side-effects are generally in accordance with those reported by Sainz, although he did not observe the extrapyramidal effects, despite his use of much larger doses, a fact which seems surprising.

*Chlorpromazine* (50 Patients).—To the time of this study, reports in the literature on the use of chlorpromazine in senile patients have been limited primarily to examples of favorable results in small groups of selected patients who have shown varying

degrees of senile agitation. The results of the present study were disappointing. Only one patient was graded as "improved," and two showed questionable "slight improvement."

Patients treated with chlorpromazine showed deterioration of functioning level in 34.7% of patients, which is significantly higher than the 5.3% deterioration rate of patients given a placebo. Inertia was observed in more than half the patients. Other side-effects were skin and oral mucosal reactions (8%), jaundice (2%), extrapyramidal effects (4%), pallor (18%), dizziness (6%), and aggravation of gait disturbance (4%).

## Conclusions

No statistically significant differences in beneficial effects were demonstrated when the changes induced by chlorpromazine, reserpine, or pentylenetetrazol were compared with effects of a placebo in senile female patients studied at the Rochester State Hospital.

In isolated instances of drug therapy, sustained improvement was observed to a degree not seen in the group of patients receiving a placebo. These isolated cases were fairly evenly distributed among the groups receiving the drugs under study. An initial improvement during the first six weeks of drug therapy observed in eight patients was followed by a regression to control levels when drug therapy was continued for an additional six weeks. Therefore, initial favorable responses must be viewed with caution.

Patients with the least degree of organic damage seemed to respond better than patients with advanced deterioration. However, the number of patients showing evidence of mild deterioration was small. A tendency to lower the level of functioning in many patients was observed with each of the medications, as compared with spontaneous deterioration observed in the group given a placebo. This tendency was statistically significant in the patients who received chlorpromazine, while the trend was not statistically significant for patients treated with reserpine or pentylenetetrazol.

Undesirable side-effects were most prevalent in the patients who received chlorpromazine. The side-effects included inertia, skin reactions, jaundice (in one case), and pallor. The most frequent side-effects encountered with reserpine included inertia, dryness of the mouth, and diarrhea. Convulsions occurred in two patients and myoclonus in two patients who received pentylenetetrazol.

In general, it may be concluded that the use of chlorpromazine, reserpine, and pentylenetetrazol (Metrazol) will not effect any significant improvement in the groups of senile patients found in state hospitals.

Section of Psychiatry, Mayo Clinic.

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# Comparison of the LSD-25 Experience and Delirium Tremens

KEITH S. DITMAN, M.D., and JOHN R. B. WHITTLESEY, M.S., Los Angeles

## Introduction

Recently psychiatry has had a renewed interest in drugs with "hallucinogenic" properties. New ones are being made, or extracted from plants, at a rapid rate. These drugs are being used more and more widely in treatment and in psychodynamic investigations. We are struck by the many claims that have been made about these psychopharmacological agents and, in particular, have noted the varied and often contradictory descriptions of their psychic effects—effects which have been labeled "experimental schizophrenia," "model psychosis," "toxic delirium," and so on. In this paper our interest in lysergic acid diethylamide, or LSD-25, is not particularly in its value in psychotherapy, or with its use as an agent for investigation of psychodynamics. Rather, our interest is in developing an objective method for studying the subjective aspects of these experiences. We have sought a method which would not interfere with the experience, or be interfered with by the experience—one in which the subject could express and describe what he had undergone in a manner that could be quantified, studied, and compared with other experiences of marked changes of consciousness, such as the delirium tremens. We choose the card-sort technique because it allows a less verbal subject to express himself with less of a handicap, and because cards lend themselves more readily to quantification than do narrative accounts, which would have been the more likely alternative. Thus, our card sort is a report of a recalled change of consciousness, a subjective experience reported in a prescribed manner.

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Lysergic acid diethylamide (LSD-25) was supplied by Mr. Harry Althouse, of Sandoz, Inc., San Francisco.

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Alcoholism Research Clinic, Department of Psychiatry, University of California at Los Angeles Medical Center.

This research was supported by a grant from the Division of Alcoholic Rehabilitation, State of California Department of Public Health.

The computations involved were made with the assistance of the IBM facilities of the Western Data Processing Center, Graduate School of Business Administration, University of California at Los Angeles.

## Methodology

This card sort consists of 300 statements, one to a card. The statements are designed to cover as many aspects of the LSD and delirium tremens experience as possible. The items were taken from the LSD literature, subjects, delirium tremens patients, and suggestions from colleagues. Also included are items that would be expected to describe aspects of psychotic experiences. The statements are phrased in the present tense to help the subject in recalling his experience. Examples of these statements follow.

"I feel anxious or fearful."
"Colors around me seem brighter."
"Others seem to be controlling my thoughts."
"Everything somehow seems more real."
"I see people or animals in motion who aren't really there."
"I feel depressed."
"Opposites seem to be related in strange paradoxical ways."

The subject was instructed to describe his experience by sorting the cards into five piles, ranging from a discard pile for these items that did not apply at all, to a top pile consisting of items that best described the most outstanding part of his experience. After he had sorted the cards into these five piles, the subject was asked to select from the top pile 10 or less cards which caught

the very essence of his experience. This "top of the top" pile then became the sixth pile.

The LSD population consisted of 70 subjects, ranging in age from 25 to 65 years. Fourteen of them were women. We classed these subjects as normals, intellectuals, neurotics, "white-collar" alcoholics, "Skid-Row" alcoholics, and non-drinking Alcoholics Anonymous members. The 20 delirium tremens subjects were "Skid-Row" alcoholics, and 8 of these patients were subsequently given LSD. Card sorting by the subjects was generally done from one to seven days following their LSD experience, usually within five days. The delirium tremens sorts were obtained anywhere from a few days to two years following the delirium tremens experience. The effect of this delay was investigated by comparing the sorts obtained within two months with those delayed by more than six months. The difference found does not significantly affect the results in this paper. Repeat sorts were done with some LSD subjects in order to calculate reliability coefficients, which averaged in the low 70's, a quite satisfactory value.

Not all the LSD subjects were supervised by us directly; some were subjects of other investigators in the area. However, most of these LSD subjects took the drug in groups of three to five persons, and were in a protective, supportive, and permissive environment, where they had an opportunity to experience music and art, and in some cases had a chance to sit quietly in the dark, walk in a garden, etc. They all received a standard 100μg. dose orally.

## Data Analysis

The accompanying figures show results which were obtained to a large extent on an IBM-650 magnetic drum digital computer. Calculations were made possible by arbitrarily assigning the values zero through 5 to the six card piles. In these figures mean values are plotted for the individual items, obtained by averaging scores from the card sorts of a number of different subjects. These mean values actually show only a part of the data, as each of the points on the graphs represents the mean of a distribution of an entire set of discrete values, distributions which merge and overlap to a degree that would be impossible to show on such a diagram. Standard deviations and *t*-scores were obtained for these many distributions; and, although these are not directly mentioned in any of the results which follow, indirect note is taken of them in our delineation of the gray areas in the Figures. These gray areas have been so chosen that they exclude all points whose *t*-scores would be expected to lie above chance at the 1% level of significance.

We have classified the 300 items into 18 categories for presentation on these slides. To arrive at these categories, a combination of two methods was used: (1) an inspection of the content of the items from a psychiatric orientation and (2) inspection of the way in which the items were picked by certain clusters of persons. Sometimes, also, a group of items, selected by one cluster of persons, would, upon inspection of their content, be further subdivided into two or more categories.

## Results

Figure 1 shows a scatter diagram comparing the average card-sort responses from 70 LSD subjects with the responses from 20 delirium tremens patients. Each of the 300 points on the graph represents one of the statements in the card-sort. The vertical distance to the point gives the average LSD score for that item, and the horizontal distance gives the average delirium tremens score. The legends along the vertical and horizontal axes relate the piles in the card sort to these distances, the top pile for the LSD experience being in the upper left, and the top pile for the delirium tremens experience being in the lower right. The discard pile is represented in both cases by the zero point, or origin.

Figure 2 shows a theoretical scatter diagram with all the points lying in the region shown in gray, which would be the case if both groups (LSD and delirium tremens) had had essentially the same experience.

If, on the other hand, the two experiences were completely dissimilar, one would expect a graph, as shown in Figure 3. Here there are but few points in the gray area except near the origin, while the majority of points lie close to the horizontal and vertical axes.

Returning now to Figure 1, we observe a situation midway between the state where the two groups have had the same experience

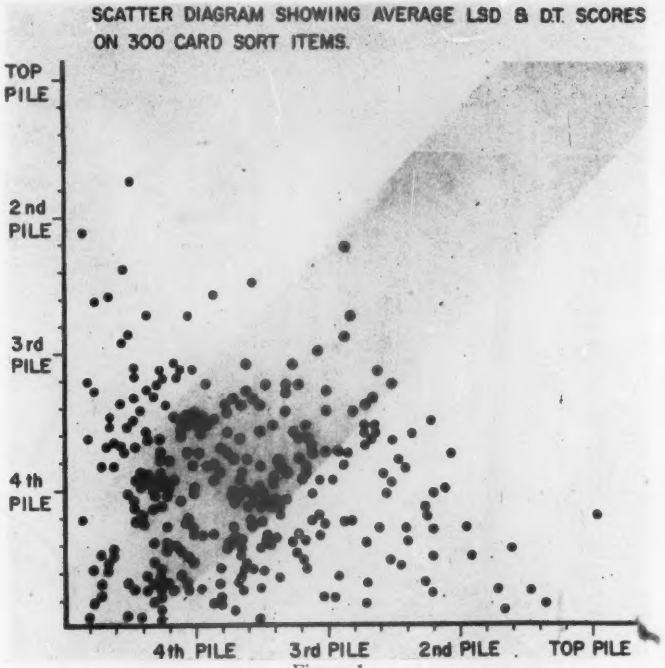



Figure 1

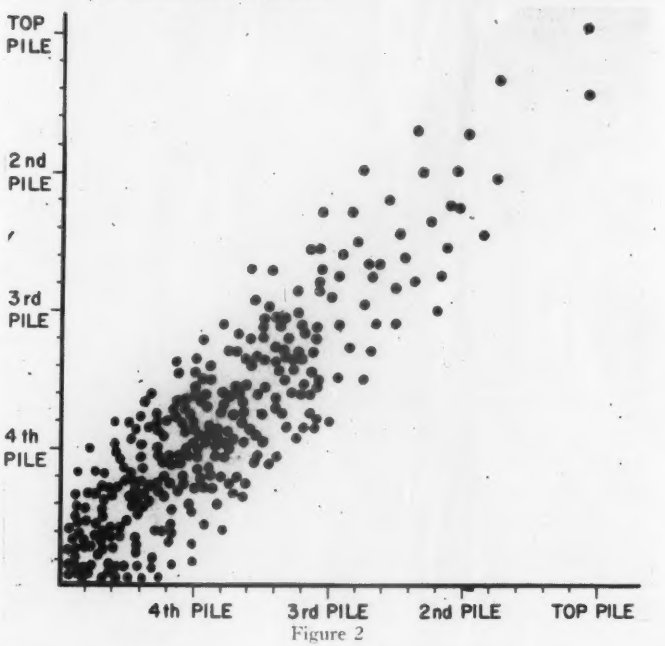



Figure 2

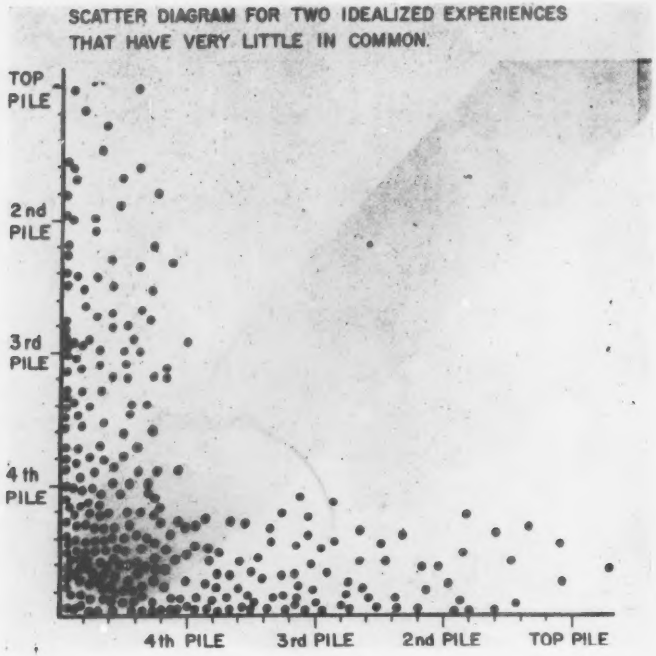



Figure 3

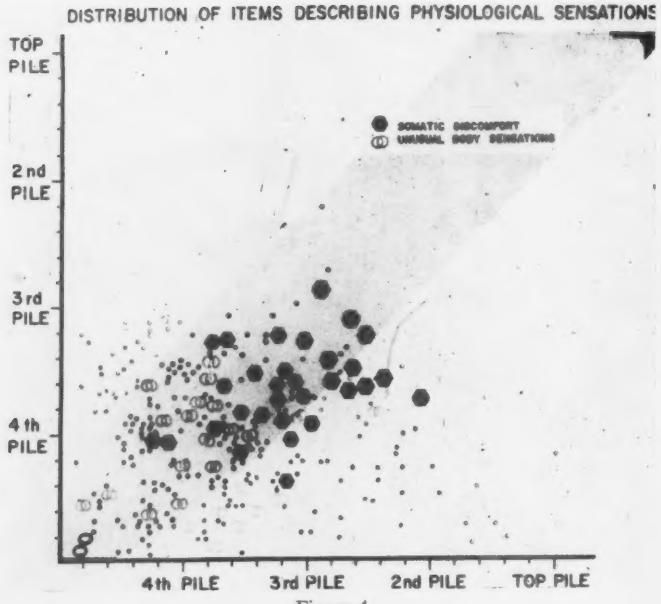



Figure 4

and the state where the two groups report very different experiences.

There are items near the vertical axis which are scored much higher on the average by the LSD than by the delirium tremens subjects. There are other items which appear primarily in the delirium tremens region along the horizontal axis, and there are items in the upper part of the gray region. These items are scored high by both groups. However, there are virtually no items which were picked solely by one group, to the exclusion of the other.

The next six Figures contain the same points that are plotted in Figure 1, except that symbols are substituted for some of the black dots. These symbols refer to the 18 categories into which we have classified the 300 items.

In Figure 4 the hexagons denote items classified in the category "Somatic Discomfort," while the horizontal interlocking circles represent the category "Unusual Body Sensations."

The "Somatic Discomfort" category includes sensations such as dizziness, shakiness, nausea, malaise, sweats, chills, headaches, and restlessness. A typical item reads: "I feel somewhat ill."

The "Unusual Body Sensations" items differs from the "Somatic Discomfort" items in that they are strange rather than uncomfortable. They include feelings of lightness, distortion of body scheme, loss of control over body and feelings, unusual sensations, and so on. Typical items are "I feel like I am floating in space," and "Parts of my body don't seem to belong to me."

These items are equally characteristic of both LSD and delirium tremens subjects, as evidenced by the fact that they lie centrally.

In Figure 5 the chevrons represent items in the "Thoughts, Recollections" category, and the letter *I*'s are items in the "Hypnagogic" category.

In the "Thoughts, Recollections" category are items which imply an upsurge of thoughts, recollections, some feelings in re-

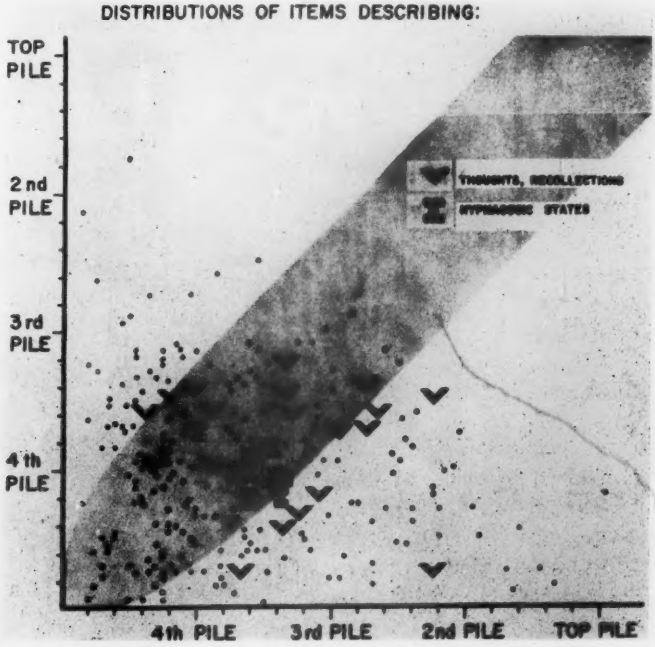



Figure 5

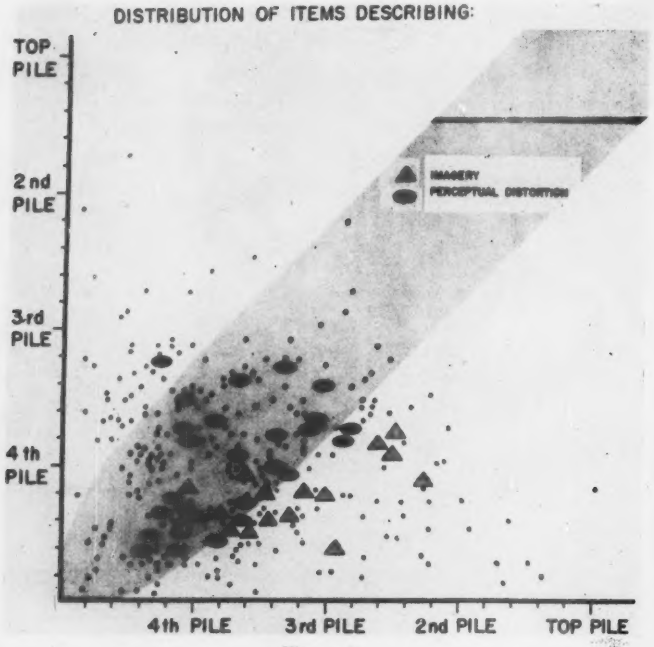



Figure 6

lation to past experiences, and difficulties encountered in verbalizing all that is happening. Examples of items in this category are "I have very vivid recall of scenes and emotions from days gone by" and "Ideas are forming so fast I can't state them all."

In the "Hypnagogic" category are items that imply loss of alertness, sleepiness, drowsiness, dreaminess, and impaired thinking. A typical item in this category is "I feel as if I were in a dream."

As in Figure 4, these items are equally as descriptive of LSD as of delirium tremens.

In Figure 6 a slight separation between the scoring by the LSD and the delirium tremens subjects begins to appear.

The upright triangles represent the "Imagery" category, which includes visual afterimages, synesthesiae, "internalized" visual images, vivid visual fantasies, and so on.

The ellipses represent the "Perceptual Distortion" category, which includes such effects as colors seeming to become brighter, distortion of sense of distance, objects appearing fluid or superimposed on themselves or changing in shape, distortion of hearing, and distortions in time sense.

The distinction between these categories is illustrated by some typical items: from the "Imagery" category, "With my eyes closed I see multicolored moving designs"; and from the category of "Perceptual Distortion," the items "Other people's faces seem to have become changing masks," and "Certain objects suddenly stand out."

As can be seen from the location of the symbols, the "Imagery" category is rather more representative of the delirium tremen's subjects, while the "Perceptual Distortion" category is relatively more characteristic of the LSD experience.

In Figure 7 the vertical bars refer to items of the "Alertness" category, which includes a subjective sense of feeling more alert mentally, of seeing more intensely, hearing more acutely, having the subjective sensation

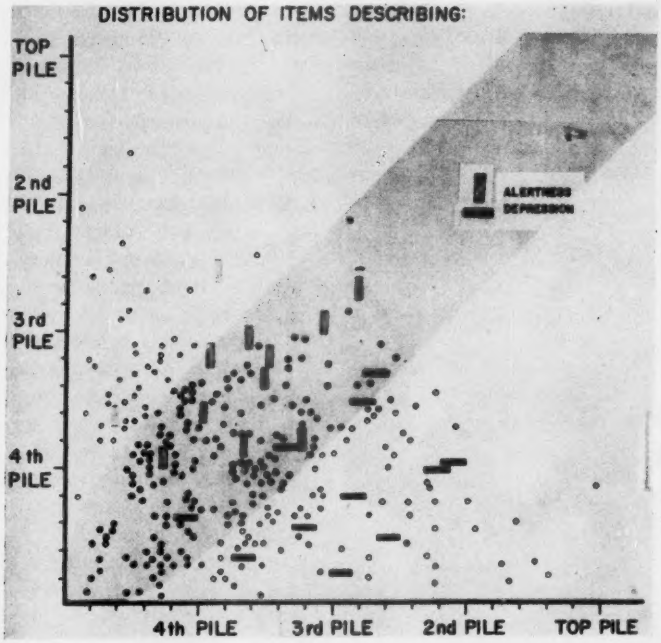



Figure 7

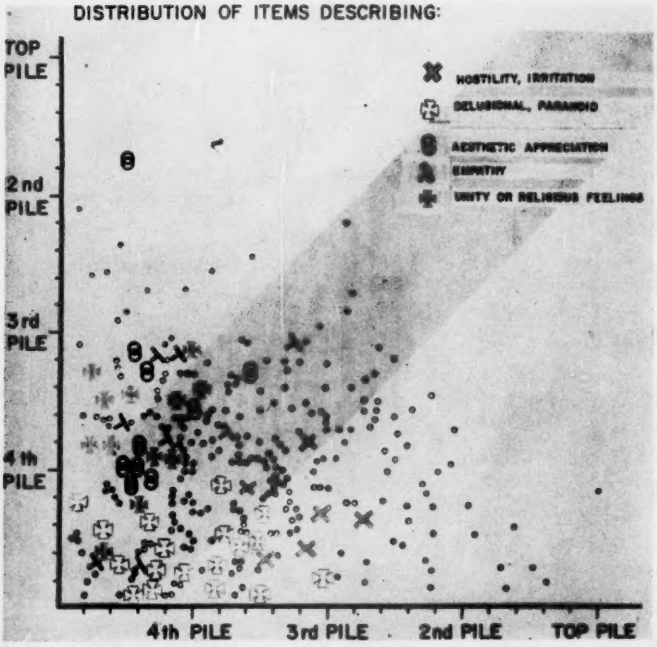



Figure 8

that one's mind is improved, and remembering very clearly what happened.

The horizontal bars refer to items of the "Depression" category, which indicate feelings of depression, guilt, sadness, dislike of self, thoughts of death, and so on. Typical items are "I feel very guilty over things I've done in the past" and "Everything seems hopeless."

As can be seen, the "Alertness" items are neutral, while the "Depression" items are more representative of the delirium tremens group.

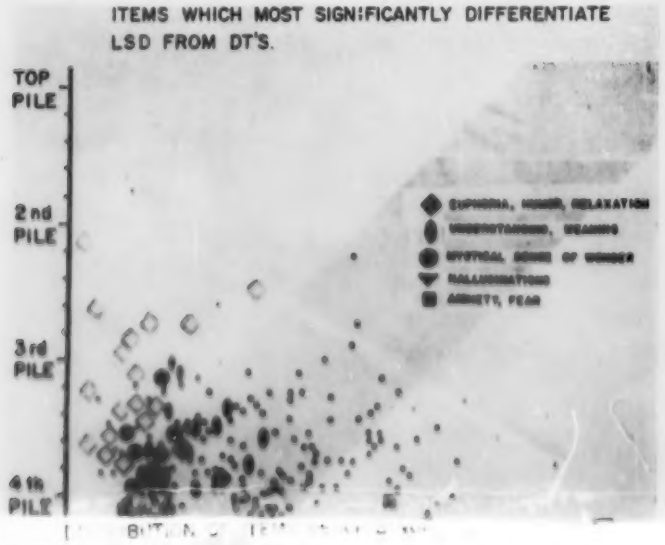
In Figure 8 there appears a separation between the types of items selected by the LSD and those by the delirium tremens subjects.

In this figure the crosses refer to a category we have called "Hostility, Irritation," and the light Maltese crosses refer to the "Delusional, Paranoid" category. In contrast to these are the vertically interlocking circles, representing the category called "Aesthetic Appreciation"; the lambdas, for a category we have called "Empathy," or, more correctly, "Human Closeness," and the dark Maltese crosses for one we have called "Unity or Religious Feelings."

The "Delusional, Paranoid" category includes delusional ideas, feelings of depersonalization, grandiose thoughts, persecutory feelings, suspiciousness, etc. A typical item is "People are talking about me." The "Hostility, Irritation" category includes hostility, irritation, annoyance with others, desire to be alone, etc. An item is "Why can't those people stop bothering me?"

"Aesthetic Appreciation" includes items about an increased enjoyment of music and art, an appreciation of serene beauty and of new values, together with a sense of quiet meditation. An item from this category is "I want to just sit and keep looking at an object for hours on end."

The category "Empathy," "Human Closeness," includes items expressing the desire to relate to others, wishing to be with others, feeling interested in others, understanding



and being understood by others, etc. A typical item is "I feel at one with the people around me."

"Unity or Religious Feelings" includes items that describe feelings of a oneness of all, of a presence of God, of a reconciliation of opposites, and of a new over-all interrelatedness of things. It includes many of the items which would fit into the definitions of the mystic as given by William James, in his "Varieties of Religious Experience" and by Bertrand Russell in his essay on "Mysticism and Logic." A typical item is "Everything is exactly right just at it is."

Figure 9 shows the last group of our categories which most markedly distinguish the LSD and delirium tremens responses. The diamonds represent the "Euphoria, Humor, Relaxation" category; the upright ellipses represent a category we have called "Understanding, Meaning" and the solid disks represent a category called "Mystical Sense of Wonder." These three lie opposite to the categories represented by squares for "Anxiety, Fear," and downward-pointing triangles, which represent auditory, visual, and tactile "Hallucinations," which seemed real.

Typical items for these categories are as follows: for "Hallucinations," "I see faces or little animals coming out of the walls," and "I see and hear things happening which couldn't be happening and yet they seem very real"; and for "Anxiety, Fear," "I seem to be on the fringes of sheer horror," and "I feel something dreadful is about to happen." The "Understanding, Meaning" category includes items in which the subject feels he has gained some insight or further understanding of himself, others, things, or ideas. For example there is the item "I seem to be seeing myself as I really am." The "Mystical Sense of Wonder" category in-

laxation" includes such items as "I feel exhilarated," "Everything seems delightfully funny," and "I feel a sense of relaxation, and a lack of urgency about doing anything."

A comparison was also made between the responses of all the alcoholic LSD subjects with all the nonalcoholic LSD subjects.

The main difference found was that the alcoholics tended toward a more uncomfortable reaction. They picked more "Somatic Discomfort" and "Depression" items, such as feeling restless, shaky, unsteady, and upset, and likened the experience to being drunk, "high," having a hangover, and being in need of a drink. They also had feelings of remorse and of a wasted life. One of the items which was picked significantly higher by them than by the nonalcoholics was "All this seems to have happened to me before"; and the one item out of the 300 which was far and away the most differentiating item between the two groups is "I feel like I do when I need a drink."

The nonalcoholics, in contrast, tended more toward items from the "Appreciation, Aesthetic," "Mystical Sense of Wonder," "Imagery," "Unity and Religious Feelings" and "Perceptual Distortion" categories. These included such items as "I want to just sit and keep looking at an object for hours on end," "With my eyes closed I see multicolored moving designs," "The folds and textures of cloth have become rich and wonderful to look at," "Colors around me seem brighter," and "The patterns and colors I find in objects and walls fill me with an amazed wonder and gratitude by their mere existence."

Eight of our delirium tremens subjects were later given LSD and also sorted the cards to describe that experience. The comparison of this subgroup of LSD and delirium tremens

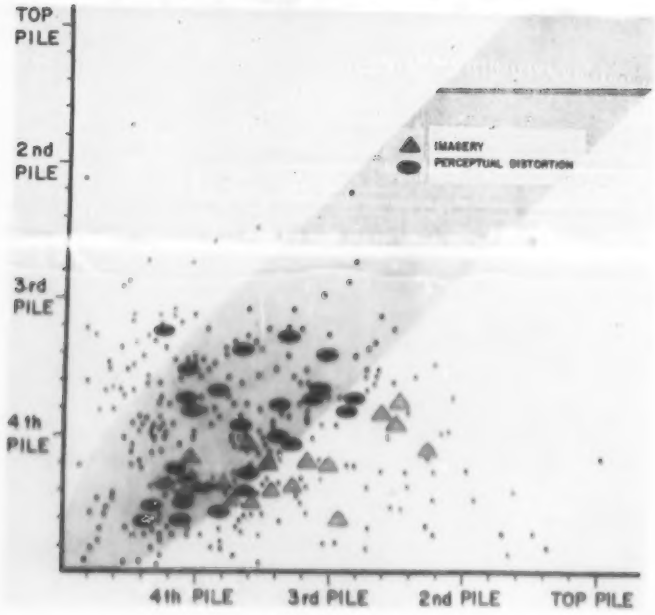



Figure 6

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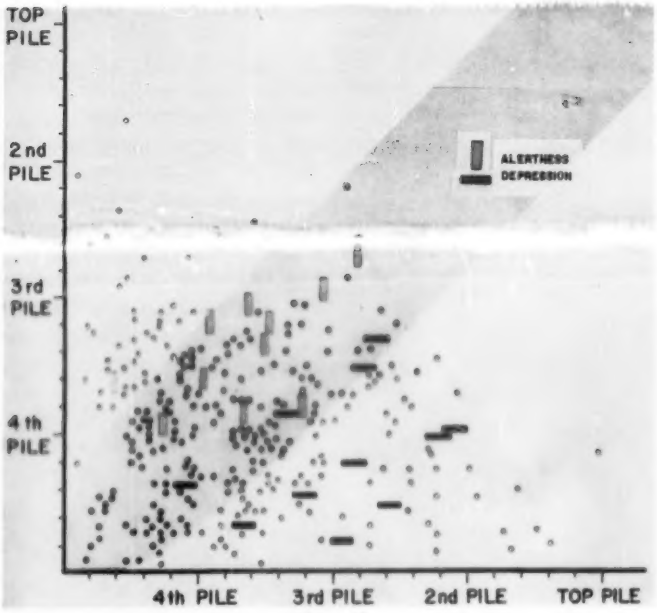


Figure 7

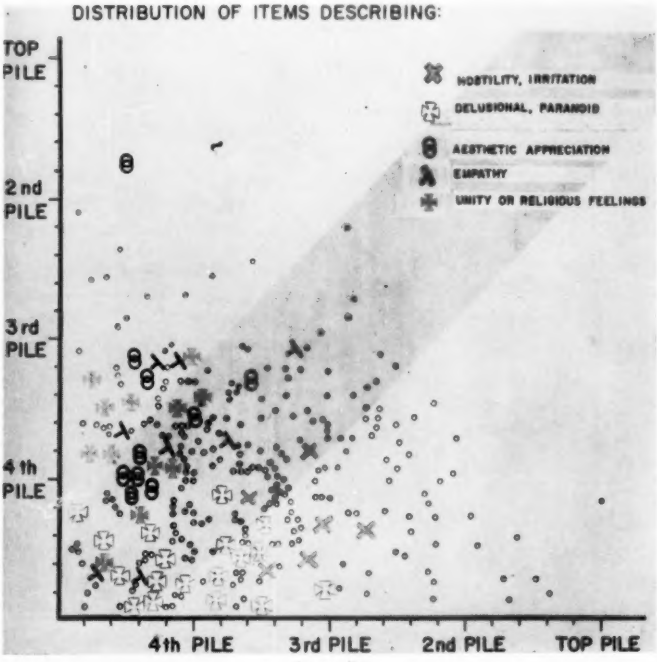


Figure 8

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In this figure the crosses refer to a category we have called "Hostility, Irritation," and the light Maltese crosses refer to the "Delusional, Paranoid" category. In contrast to these are the vertically interlocking circles, representing the category called "Aesthetic Appreciation"; the lambdas, for a category we have called "Empathy," or, more correctly, "Human Closeness," and the dark Maltese crosses for one we have called "Unity or Religious Feelings."

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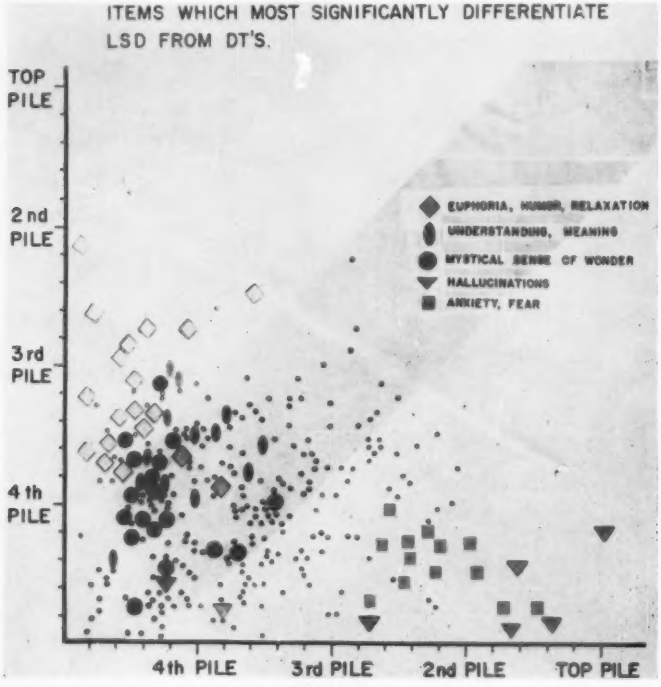


Figure 9

and being understood by others, etc. A typical item is "I feel at one with the people around me."

"Unity or Religious Feelings" includes items that describe feelings of a oneness of all, of a presence of God, of a reconciliation of opposites, and of a new over-all interrelatedness of things. It includes many of the items which would fit into the definitions of the mystic as given by William James, in his "Varieties of Religious Experience" and by Bertrand Russell in his essay on "Mysticism and Logic." A typical item is "Everything is exactly right just at it is."

Figure 9 shows the last group of our categories which most markedly distinguish the LSD and delirium tremens responses. The diamonds represent the "Euphoria, Humor, Relaxation" category; the upright ellipses represent a category we have called "Understanding, Meaning" and the solid disks represent a category called "Mystical Sense of Wonder." These three lie opposite to the categories represented by squares for "Anxiety, Fear," and downward-pointing triangles, which represent auditory, visual, and tactile "Hallucinations," which seemed real.

Typical items for these categories are as follows: for "Hallucinations," "I see faces or little animals coming out of the walls," and "I see and hear things happening which couldn't be happening and yet they seem very real"; and for "Anxiety, Fear," "I seem to be on the fringes of sheer horror," and "I feel something dreadful is about to happen." The "Understanding, Meaning" category includes items in which the subject feels he has gained some insight or further understanding of himself, others, things, or ideas. For example there is the item "I seem to be seeing myself as I really am." The "Mystical Sense of Wonder" category includes those experiences in which there was a sense of sudden insight into the depths of truth, revelations, illuminations, and significances, as, for example: "Only now do I really see the point of existence." Finally, the fifth category, "Euphoria, Humor, Relaxation" includes such items as "I feel exhilarated," "Everything seems delightfully funny," and "I feel a sense of relaxation, and a lack of urgency about doing anything."

A comparison was also made between the responses of all the alcoholic LSD subjects with all the nonalcoholic LSD subjects.

The main difference found was that the alcoholics tended toward a more uncomfortable reaction. They picked more "Somatic Discomfort" and "Depression" items, such as feeling restless, shaky, unsteady, and upset, and likened the experience to being drunk, "high," having a hangover, and being in need of a drink. They also had feelings of remorse and of a wasted life. One of the items which was picked significantly higher by them than by the nonalcoholics was "All this seems to have happened to me before"; and the one item out of the 300 which was far and away the most differentiating item between the two groups is "I feel like I do when I need a drink."

The nonalcoholics, in contrast, tended more toward items from the "Appreciation, Aesthetic," "Mystical Sense of Wonder," "Imagery," "Unity and Religious Feelings" and "Perceptual Distortion" categories. These included such items as "I want to just sit and keep looking at an object for hours on end," "With my eyes closed I see multicolored moving designs," "The folds and textures of cloth have become rich and wonderful to look at," "Colors around me seem brighter," and "The patterns and colors I find in objects and walls fill me with an amazed wonder and gratitude by their mere existence."

Eight of our delirium tremens subjects were later given LSD and also sorted the cards to describe that experience. The comparison of this subgroup of LSD and delirium tremens experiences was found to be, in general, similar to the comparison of the larger LSD and delirium tremens populations. The 300 items had approximately the same distribution of mean scores for the two groups. In the smaller group there was a little more dispersion of the

categories, a finding which is in keeping with the smaller number of subjects. In this smaller group the "Somatic Discomfort" and "Depression" categories tended more toward the LSD area, while the "Imagery" category was more in the delirium tremens area. The all-alcoholic population comprising this subgroup might account for the shift.

## Comment

To use subjective reports for a study of changes of consciousness is at once highly intriguing, difficult, and problematical. When the attempt is made, as we have done with a card sort which purports to describe a recalled change of consciousness in a prescribed and quantifiable manner, two types of difficulties arise. First, as with any psychological instrument, there is the question of validity. To what extent do the subjects forget what they experienced, and how suggestible are they? To what extent do they pick items merely to please the investigator, or so as not to appear too different from what they view as the norm? Further, when it is impossible to maintain identical settings and environments in the two experiences under comparison, to what extent are the differences due to the setting, and to what extent are they due to the drug or other etiologic agent? Preliminary findings obtained using another drug (JB336, Lakeside Laboratories, Inc.) has lessened our concern over this last point with respect to the LSD-delirium tremens comparison. This newer drug seems to approximate far more closely the delirium tremens pattern than does LSD, even when it is administered in a setting similar to that which was obtained for our LSD subjects.

The second difficulty lies in the variability of these states of consciousness. The LSD experience is really not one, but many, experiences, as is the delirium tremens. We have subdivided our LSD subjects into a number of groups and find that various clusters of people have predominantly one kind of experience or another. Thus, there are some people who have primarily a euphoric experience, others who have a visual image type of experience, and still others who obtain mainly somatic discomfort and depression from the drug. To discuss adequately the various clusters of people having different types of experiences is a subject in itself, which we hope to develop in a later paper. We can take time only to note that for many items there is fully as wide a spread in the responses from the different LSD subgroups as there is between the average LSD and delirium tremens responses.

Thus, what we have shown is not the comparison of two experiences as such, one with the other, but, rather, a comparison of two clusters of experiences. On the graphs are illustrated some average trends among the highly individualized and varied responses that were exhibited by a particular sample of persons in a particular setting.

## Summary

Seventy lysergic acid diethylamide (LSD) subjects and twenty delirium tremens subjects described their respective experiences by sorting into six piles 300 statements pertaining to some aspect of these two experiences. The average experiences from these subjects were discussed in terms both of their similarities and of their differences. The delirium tremens experience was predominantly characterized by hallucinations that seemed real, anxiety, horror, depression, irritation, and paranoid thoughts. The LSD experience, in contrast, was typified by euphoria, humor, relaxation, and a nebulous sense of wonderment.

Both groups reported perceptual distortions, visual images, the sensation of increased mental alertness, somatic discomforts, distorted affect, and the sensation of having an increased rate of thought.

A method is exemplified that provides a means by which one can make comparisons using different drugs and dosages on different populations in varied psychological and physical environments.

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# Cultural Determinants of Response to Hallucinatory Experience

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Hallucination attracts the attention of the anthropologist for several reasons: First, because, as one of the most ancient and most widely distributed of the modes of human experience, most, if not all, human cultures provide definitions of and responses to it which are of interest to the descriptive ethnographer; second, because a vast quantity of content has been introduced into the cultural repertoire of mankind by hallucinatory ideation in dreams, visions, and hypnogogic imagery, and hallucination must therefore be considered in relation to culture change; and, third, because hallucination is often defined in Western societies as a symptom of mental and/or physical disease, and anthropologists play a role in medical research in these societies. It is in the last context, particularly in the area of mental health research, that the present inquiry is undertaken.

Cross-cultural materials on hallucination may be of interest in a mental health research context in at least two ways. First, and rather obviously, both psychiatrist and anthropologist will expect the manifest content of hallucination to vary, as does the content of other behavior, to some degree with cultural setting, and they may be interested in the range, frequencies, and associations of various types of manifest content. Differences of opinion exist in regard to the supposed variability of latent content: Lincoln, in his study of dreams in primitive cultures, and other psychoanalytically oriented scholars have emphasized the universal presence in dreams of Oedipal themes and the classic "Freudian" symbols [13]; less strictly psychoanalytic ethnologists have not emphasized the presence of these themes so much as culturally and personally idiographic ones.[2,3] In any case, however, we shall not be primarily concerned with the content per se of hallucinations. Rather, we shall deal with the problem of the definition of and response to the experience, by the society, by the scientific observer, and by the hallucinator himself. The rationale for such an approach, in a mental health context, is twofold: First, knowledge of the range of definitions and response, and their cultural associations, may help in diagnosis and in communication with patients; and, second, it is likely that in some cultural subgroups in our society the nature of definition and response to hallucination entertained by hallucinator and his associates may aggravate or precipitate other mental disabilities in the hallucinating person. Indeed, the mental patient may suffer from added anxiety precisely because of the nature of the definition of hallucinatory experience which he entertained prior to experiencing it himself. Certainly among hospitalized patients in our society, the attempt to conceal hallucinatory experiences from the staff is both chronic and, in one sense, realistic: Staff members frequently take a negative view of hallucinations, and hallucinating patients are subject to measures which, from the patient's standpoint, may be punishments (de-

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lay in discharge, restriction of privileges, questioning on sensitive issues, subtle contempt, and even ridicule, from both staff and other patients).[23]

### Problems of Definition

Uncertainties of definition impede research in the area of hallucinatory experience. Although hallucination is commonly treated by psychiatrists as a symptom of mental disorder, its occurrence is neither a necessary nor a sufficient condition for such a diagnosis. Most psychiatrists, furthermore, impose two restrictions on the word "hallucination," excluding from its extension those ideational experiences which occur during sleep and assigning to it a generally negative valence. These restrictions are useful in psychiatry in our own cultural setting, but they are not helpful in establishing a cross-culturally applicable definition (nor need they be, for a Western psychiatrist's definition is to be regarded as only one cultural variant), since in some societies dreams and waking visions may be for many purposes treated as equivalent. For the purposes of this study, "hallucination" will be defined, very broadly, as pseudoperception, without relevant stimulation of external or internal sensory receptors, but with subjective vividness equal to that aroused by such stimulation. Included in its extension, therefore, are dreams, the waking "hallucinations" of psychiatric terminology, and hypnogogic imagery; excluded is the fainter audiovisual imagery of reflective thought. There remains a somewhat dubious category, occasionally referred to as hallucinations in the psychiatric literature, of perceptions whose subject matter is unambiguously provided by external stimulation but whose form displays subtle or gross distortion. The most familiar examples are the undulating floors, stretched perspectives, echoing sounds, and other distortions experienced by some subjects on administration of the so-called hallucinogenic or psychotomimetic drugs, and by normal subjects who have consumed narcotics, or alcohol, have been breathing anesthetics, or are in process of losing consciousness (fainting). We shall leave these phenomena out of the range of our definition, on the ground that a "hallucinatory" dimension already exists, of vividness of subjective imagery in the absence of sensory stimulation, at all points of which the pseudoperception may be equally undistorted, and relate these dubious cases, rather, to a logically independent dimension of perceptual distortion. The relationship between the two dimensions may, of course, be investigated empirically.

A second major problem, in addition to the concept of hallucination itself, is that perennial flower of confusion, the word "possession." Casual observers and many anthropologists alike use this word in two very different senses: as a label for some person's overtly observable behavior, and as a label for a native theory to explain this behavior. These two uses are, unhappily, often confused. It may be best to state flatly, at the outset, that I shall use the word "possession" to denote any native theory which explains some event of human behavior as being the result of the physical presence, in a human body, of an alien spirit which takes over certain or all of the host's executive functions, most frequently speech and control of the skeletal musculature. A phenomenon of possession does not, therefore, for me exist; the word merely labels a theory.

Now the possession theory happens to be frequently applied, in folk beliefs, to three very different classes of phenomena, for each of which other terms exist. One of these is hallucination; the second is hysterical dissociation (including multiple personality, fugues, somnambulism, conversion hysterias, and hypnotic states); the third is obsessive ideation and compulsive action. Clinically, these are distinguishable phenomena. But any one, or group, of them can be, in folk theory, explained by the mechanism of possession. Unfortunately, some observers have, in their eagerness to empathize with their subjects, used the word

possession to denote not only a type of folk theory but also whatever phenomenon their folk happen to use the theory to explain. In other words, if a people use the concept of "possession" to explain certain hysterical dissociations (such as the stereotyped fugues which are so commonly induced in many religious rituals), the anthropologist tends to say that the dancers in the ritual are "possessed"; similarly, if a people use the theory to explain hallucination (which is, incidentally, a less common use of the concept), the anthropologist may refer to hallucinators as "possessed" persons. Even more confusingly, the ethnographer may use the word to denote any person who is thought to be persistently influenced by a supernatural being, whether located inside or outside the person's body.

A third problem of conceptual ambiguity is the notion of trance. There would seem to be at least two major uses of this term: (1) to denote physiological collapse with coma or the occasionally concomitant delirious hallucinations; and (2) to denote (again) states of dissociation. The possibilities of semantic confusion are manifest.

### Problems of Methodology

At first, it was hoped that the Human Relations Area Files (HRAF), including the old Cross-Cultural Survey Files at New Haven and the completed portions of HRAF at New Haven and Philadelphia, would provide a sample of societies various of whose cultural features could be statistically related to the phenomena of hallucination. The data contained in HRAF, however, even when supplemented by material from sources not tapped by HRAF, and by data on societies not included in HRAF, proved to be not amenable to statistical treatment, for three reasons: A sample which included representative cultures from all major culture areas was not available; the data were not comparable from society to society, because of the extreme unevenness of the reporting (ranging from no report at all to careful, extensive, and psychiatrically informed study), and the data provided were usually too crude to permit the discriminations which I regarded as significant for statistical categories. No quantity of time or money spent in HRAF and other library compilations can remedy all of these defects of the ethnographic literature, and only a vast expenditure of funds in field work could amass new and adequate data on a sufficient number of societies. The inference to be made is, rather, that the ethnographic literature available for areal or world samples, of the sort envisioned by Murdock[14] and others in connection with HRAF, is not suitable for statistical analysis with respect to all dimensions of anthropological interest, but is suitable only with respect to certain highly formalized and conventionally reported dimensions, such as kinship and subsistence activities. The cultures on which data were collected from HRAF in the abortive statistical phase of the study are the following:

| | |
|---|---|
| Abipone | Crow |
| Achewa | Cuna |
| Ainu | Dahoman |
| Andamanese | Easter Island |
| Apiaca | Gros Ventres |
| Apinage | Hopi |
| Aranda | Ifugao |
| Arikara | Indian Yoga |
| Assiniboin | Kamilaroi |
| Balinese | Kwakiutl |
| Bena | Lamba |
| Blackfoot | Maori |
| Buka | Marshallese |
| Bushman-Hottentot | Plateau area (North America) |
| Canella | Sherente |
| Chuckchee | |
| Creek | |

Since nontrivial and significant statistics appeared to be unachievable, the obvious next step was to consider what prestatistical manipulations of the data were possible and whether any of these might yield formulations of interest. Experimentation along these lines brought me to construct a rather tedious list of "existence theorems," which I shall not reproduce here, but which proved later to be valuable in setting up the matrix of concepts. Existence theorems are

eminently prestatistical, but they are necessary to any sort of statistical description, since they define the relevant and nontrivial categories. An existence theorem is merely a statement that of the class $x$ there is at least one member concerning which the statement $p$ in true; thus, for instance, the theorem

$$(\exists x)p_1(x)$$

where

$(\exists x)$ = df "there exists at least one $(x)$ such that . . ."

and

$(x)$ = df "society"

and

$p_1$ = "hallucinations are defined by some member of the society as meaningless concatenations of visual and/or auditory pseudo-perceptions."

The whole of the theorem would read: "There exists at least one society such that hallucinations are defined by some members of the society as meaningless concatenations of visual and/or auditory pseudoperceptions." From the existence theorems, derived from the HRAF cross-cultural materials and from my ethnographic knowledge, the dimensions of hallucinatory experience shown in Table 1 were constructed. These dimensions are offered as a formal frame of reference within which to observe cultural definitions of hallucinatory experience, and as a rough statement of the range of cultural variability evident in the ethnographic record.

With the foregoing semantic and methodological considerations in mind, we may proceed to discuss, informally and nonstatistically, certain implications of the ethnographic data.

## Conditions of Hallucination

If one were to design an electronic brain which behaved in all respects like a normal human brain, one would have to include in its specifications both a capacity for hallucination and a capacity to distinguish hallucination from sensory perception. Most human beings hallucinate (in the broad sense of the term which is employed in

TABLE 1.—*Dimensions of Hallucinatory Experience*

| | |
|---|---|
| A | Communication |
| $a_1$ | Contains no information but is a meaningless pattern of auditory or visual images |
| $a_2$ | Contains information in the form of observation of phenomena that really exist somewhere (but are not messages) |
| $a_3$ | Contains message from a supernatural being (ghost, soul, demon, divinity, etc.) located outside Ego's body |
| $a_4$ | Contains message from, or is the experience of, a supernatural being (ghost, soul, demon, divinity, etc.) located inside Ego's body |
| $a_5$ | Contains message from one part of self (e. g., own soul, conscience, memory, Id, subconscious, etc.) to another (e. g., consciousness, ego, etc.) or to other person |
| $a_6$ | Contains message from a natural being communicating by means of radio, telepathy, or other means of telecommunication |
| B | Mechanism of control |
| $b_1$ | Can be controlled by hallucinator and/or hallucinator's fellows by manipulating physical condition and/or foreign biochemical factors |
| $b_2$ | Can be controlled by hallucinator and/or hallucinator's fellows by nonphysical means (such as will, prayer, ritual, worry, suggestion, autosuggestion, psychotherapy, etc.) |
| $b_3$ | Can be controlled by will of alien supernatural or natural being |
| $b_4$ | $b_1 \wedge b_2$ |
| $b_5$ | $b_1 \wedge b_3$ |
| $b_6$ | $b_2 \wedge b_3$ |
| $b_7$ | $b_1 \wedge b_2 \wedge b_3$ |
| $b_8$ | Other $(\sim[b_1 \vee b_2 \vee b_3])$ |
| C | Induction |
| $c_1$ | Hallucinator seeks to induce or repeat experience |
| $c_2$ | $\sim c_1$ |
| D | Concealment |
| $d_1$ | Hallucinator conceals experience from group or denies occurrence |
| $d_2$ | $\sim d_1$ |
| E | Punishment |
| $e_1$ | Group institutes punishment and/or social extrusion |
| $e_2$ | $\sim e_1$ |
| F | Therapy |
| $f_1$ | Group or individual institutes therapeutic and/or prophylactic measures |
| $f_2$ | $\sim f_1$ |
| G | Role assignment |
| $g_1$ | Experience qualifies individual for valued social role (adulthood, shaman, healer, diviner, priest, etc.) |
| $g_2$ | $\sim g_1$ |
| H | Behavior guidance |
| $h_1$ | Content of experience may be taken as guide for individual and/or group action (other than therapeutic) irrespective of social role of hallucinator |
| $h_2$ | Content of experience taken as guide for individual and/or group action (other than therapeutic) only when hallucinator already fills certain social roles (e. g. shaman, prophet) |
| $h_3$ | Content of experience not taken as guide for individual and/or group action (other than therapeutic) |

this paper), in one way or another, quite frequently; and there is no society, to my knowledge, in which hallucinatory experience is unknown. Hallucination is, in fact, one of the most widely distributed of the modes of human experience. Explicit reports of dreams, visions, and the hearing of voices are found in the sacred literature of the pre-Christian Near East; if mythology, ritual, and other religious behavior be regarded as in part the legacy of such experiences passed on by oral or written tradition, we may suspect an antiquity measured in tens or hundreds of millenia.

Under the general rubric of hallucination, however, there can be assembled a wide range of types of experience, from the vivid and realistic supplanting of reality in ecstatic visions and auditory revelations, to a relatively pallid verbal or visual imagery which blends imperceptibly into ordinary "thought." These experiences are known from Western clinical observations to be prompted by the most various circumstances: sleep, anoxia, pharmacologic agents, brain tumors, psychological stress, fatigue, sensory restriction, and others. Relatively little seems to have been done to relate the conditions precipitating and surrounding an event of hallucination to the content of the experience; ethnographic investigation may offer a few clues here.

The specific conditions under which hallucinations have been reported in the ethnographic literature may be divided into the following categories:

| | |
|---|---|
| Sleep | Special exercises (breath control, posture, sensory restriction) |
| Fatigue | |
| Hunger and thirst | |
| Prolonged physical pain | Drugs |
| Extreme physical illness | Emotional stress in normal persons |
| Social isolation | Mental illness |

It should be noted that these conditions are not logically independent, and that frequently (and especially, in voluntarily induced hallucination) two or more of the conditions are realized at the same time.

Three observations are pertinent. First, in many societies relatively little significance is attached to differences in the conditions under which hallucination occurs. In particular, dreams during sleep, spontaneous waking visions, and induced hallucinations under drugs or stress may be given equal status and comparable evaluation. Western society is remarkable for the importance it assigns to differences in the precipitating conditions of hallucination; the most striking example, of course, is afforded by the profound distinctions we draw among dreams (in sleep), delirium (in illness or intoxication), and "hallucination" in the restricted sense (in the waking state). Second, we must take note that, although not all hallucinatory experiences are regarded as desirable in any society, in primitive societies it is very common for hallucinations with desirable content to be not only accepted with pleasure but deliberately sought with the aid of such devices as hallucinogenic substances (e. g., some American Indians ingest parts of the cactus peyote and Paleo-Siberians, the mushroom fly agaric) and various sorts of personal disciplines, ranging from breathing and posture exercises, through hunger, thirst, and isolation, to prolonged physical self-torture. The tendency to minimize discrimination among hallucinations on a criterion of precipitating condition of course does not imply any inability to discriminate between hallucination and sensory perception; the preferential status of hallucinatory experiences is possible only when it is clearly differentiable from normal experience. Third, it appears that both the subjective feeling tone and the specific content of the hallucination are heavily influenced by a still more pervasive condition: the cultural milieu in which the hallucination, and particularly the voluntary hallucination, takes place.

The latter point is worth elaborating here, although it anticipates some of the material to follow, because it is relevant to the methodology and evaluation of clinical research with hallucinogenic compounds under varying experimental conditions. Typically in such research the clinician administers

to a group of healthy urban adults, often persons themselves identified with the medical or an auxiliary-medical profession, a substance which induces various instrumentally measurable physiological changes and observable alterations in behavior. The subjects are asked also to report verbally on their subjective experience. These verbal reports reveal a considerable variety of experience: Some subjects are euphoric; some are entranced by the intensity of esthetic pleasure they achieve in the contemplation of color, form, and movement divorced from meaning; many complain of anxiety, physical discomfort, various unwelcome perceptual distortions, and attitudinal changes; some hallucinate and some do not. These various reports and observations are taken to indicate the psychological actions of the drug. Similarly variable results, but usually with transient intensification of chronic symptomatology, are given by mental patients from roughly comparable cultural backgrounds (but, of course, by virtue of illness occupying a very different social status). But no *cultural* controls are employed; and it is possible that to an unknown degree the subjective experience, and hence even the physiological measures, is influenced by the negative attitude toward any distortion of normal sensory and cognitive experience which many members of our society share, at least those people who do not customarily seek such special experiences as are afforded by narcotics and alcohol or by mystical or esthetic preoccupations.

Some indication of the quality and magnitude of the possible effect of differing cultural attitudes toward hallucinatory experience under differing conditions of drug administration is given by the differences in the experiences reported by normal white subjects after administration of mescaline and by American Indians after consumption od of introduction, and of intragroup personality differences: first, the influence of tains mescaline).

The literature on the mescaline experiences of normal subjects is rather scattered, and some of it, particularly if it has an early date of publication, is unsatisfying because of the inadequacy of sample description and the disjointed and anecdotal style of presentation conventional at the time. Nevertheless, the consultation of several prime sources [6,7,25] reveals a reasonably consistent pattern of described phenomena, which contrasts with the pattern described (also, unfortunately, sometimes in undefined samples) by anthropologists' American Indian informants.[11,12,16,20,24] The fact of major contrast has been briefly remarked in print by one of the foremost anthropological students of peyotism, Slotkin,[21] who observed in the course of discussion of attempts of white persons to suppress peyotism that "the responses described in clinical experiments on Whites are so different from the responses described by Indian Peyotists . . . as to fall into completely different catego-

TABLE 2.—*Contrasts in Prevailing Character of the Responses of Clinically "Normal" White and Indian Subjects of Mescaline Intoxication*

| White | Indian |
|---|---|
| Variable and extreme mood shifts (agitated depression, anxiety, euphoria, depending on stage of intoxication and personal characteristics) | Initial relative stability of mood, followed by religious anxiety and enthusiasm, with tendency toward feelings of religious reverence and personal satisfaction when vision achieved, and often, also, expectation of "cure" of physical illness |
| Frequent breakdown of social inhibitions and display of "shameless" sexual, aggressive, etc., behavior | Maintenance of orderly and "proper" behavior ("revivalistic" enthusiasm is socially proper in context) |
| Suspiciousness of others present in environment (reported to be uniformly present by Guttmann and noted in self by Klüver) | No report of suspiciousness |
| Unwelcome feelings of loss of contact with reality, depersonalization, meaninglessness, "split-personality," etc. | Welcome feelings of contact with a new, more meaningful, higher order of reality, but a reality prefigured in doctrinal knowledge and implying more, rather than less social participation |
| Hallucinations largely idiosyncratic in content | Hallucinations often strongly patterned after doctrinal model |
| No therapeutic benefits or permanent behavioral changes | Marked therapeutic benefits and behavioral changes (reduction of chronic anxiety level, increased sense of personal worth, more satisfaction in community life) |

ries; they do not seem to be talking about the same thing." The salient differences in the reports are displayed in Table 2; the reader should note that a meaningful statistical presentation of frequencies of response types, while desirable, is precluded by the nature of the data available.

These marked differences would seem to be plausibly explained by two related factors which are independent of possible differences in racial physiology, of chemical action of the drug owing to variations in dosage, mixture with other agents, of method of introduction, and of intragroup personality differences: first, the influence of the setting in which the drug is taken (the white subject's experiences occur usually in a hospital or university research setting; the Indian experiences, in a ceremonial lodge during a solemn religious ritual); and, second, differences in the psychological meaning of the primary drug effects when experienced. Certainly, gross enough situational and semantic differences exist: White normal subjects generally take mescaline once or twice, in a clinical research setting, with definite knowledge of an experimental or a clinical purpose in the investigation, and without any commitment to or interest in peyote, or to mescaline in any form, as a personal religion; Indian peyote users take mescaline repeatedly, in a solemn religious setting to the accompaniment of serious ritual, with definite knowledge of a religious purpose in the usage and, often, with hope for personal salvation, of which the vision is the evidence. The former factor—the setting—has been reported by Fernberger[5] to yield differences in content, which can to some degree be affected both by suggestion by the experimenter and by autosuggestion. The latter, the semantic, factor would seem to be significant at the present stage of theory concerning the action of the hallucinogens, since it is recognized that both personal character and, perhaps, personally or culturally determined values concerning the "homeostasis of subjective-experience" may affect response to experimentally induced changes in sensation and perception.[19] We quote the work of Hoch, Cattell, and Pennes[8] in this connection.

> We have pointed out that the alterations in the vegetative nervous system appear first under the influence of mescaline, lysergic acid, pervitin, etc. This is usually followed by alterations of perception, bodily sensations, and changes in body image. In many patients it would appear that the perceptual alterations are conducive in producing anxiety, uncertainty, and, at times, rage. Seemingly, the perceptual alterations lead to a lowering of reality control, thence to tension and anxiety, which in turn lead to depressive, aggressive, and paranoid manifestations. Schizophrenic patients whose reality contact is already impaired are seemingly more vulnerable to drugs that have a disorganizing effect on reality perception. As yet it is unclear whether the emotional alterations seen in these patients are due to a physiological action of the drug *per se* or due to the experiencing of an alteration of reality and other changes on a psychic level.

### Interpretation of Content

In most primitive societies, even if (on other grounds) the hallucinator is regarded as being ill, or the hallucination itself is unpleasurable, the content will not be regarded as a meaningless concatenation of pseudoperceptions. The content of hallucination is sometimes interpreted as a message introduced directly into the subject's consciousness by a supernatural being, directed either to the hallucinator himself or to the community through him as an intermediary. More frequently, hallucination will be interpreted as a real perceptual experience by the soul, which has wandered from the body and is seeing and hearing events involving real or supernatural persons which are occurring in another place, or which is able to see and hear events and supernatural beings present but imperceptible to others. The message-intrusion theory tends to blend into primitive theories of possession; in our society, it is expressed in the conventional telepathy, radio, radar, brain-washing, and electrical-current delusions and is classed as a paranoid mechanism, while the spiritual-perception theory is associated with extreme

religious enthusiasm. But in both theories, the content of hallucination is interpreted as significant information.

In at least two culture areas, that of the 17th-century Iroquois Indians of what is now New York State,[26] and of Western society after the advent of psychoanalysis, a third theory also has existed as an alternative explanation for hallucination. In this theory, the hallucination conveys an emotion-laden message from the soul, or some unconscious part of the mind, to the conscious self, and thus is a process of thought. This view, like the others, regards the content of hallucination as a message containing information. It appears to be a rare idea that the content of hallucination is meaningless, and one may hazard the guess that this notion is largely confined to psychiatrically unsophisticated, nonparanoid, and tepidly religious, or nonreligious, members of Western society.

If a hallucination is regarded as a message, there are evidently two approaches to its interpretation: to take the manifest content literally, and to regard the manifest content as a symbolic expression of significant underlying ideas. The latter approach may entail various techniques, such as guessing and devices of free association, the consultation of a formal list of symbols and their meanings, and the more or less standardized derivation of meaning from the context of circumstances (such as ritual, illness, situational stresses, and the like) in which the hallucination occurred. It is not important here whether or not there are, in truth, universal themes and symbols expressed in dreams and other hallucinatory experiences, as psychoanalytic theory and data suggest. The important point is that most human beings, in most societies, outside Western civilization, regard hallucinatory content as communication bearing significant information which can be understood either directly or by the use of special methods of interpretation.

Now this belief in hallucinatory content as communication, particularly when it is coupled with the conviction that the communication is not merely intrapsychic, seems to have an effect both on the content of hallucination and on the hallucinator's, and his community's, response to it. Hallucination in itself is not frightening, either to hallucinator or to his community, although the content may be; but even if the content is frightening, it is valuable knowledge. Hence the overt response to hallucination will very likely be markedly affected by its classification as communication.

It is to the topic of response to hallucination that we now turn.

## Response to Hallucination

The difference in response between English white and Australian black to a course of hallucinations in a mourning woman is vividly illustrated in the following anecdote, reported by Parker,[15] the author of a study of the Euahlayi tribe of Australia.

> Our witch woman was rather a remarkable old person. When she was, I suppose considerably over sixty, her favourite granddaughter died.
>
> Old Bootha was in a terrible state of grief, and chopped herself in a most merciless manner at the burial, especially about the head. She would speak to no one, used to spend her time about the grave, round which she fixed upright posts which she painted white, red, and black. All round the grave she used to sweep continually.
>
> More and more she isolated herself, and at last discarded all her clothes and roamed the bush à la Eve . . . as she had probably done as a young girl.
>
> She dug herself an underground camp, roofed it over, and painted enormous posts which she erected in front of her "Muddy wine," as she called her camp. She never came near the house, though we had been great friends before.
>
> She used to prowl around the outhouses and pick up all sorts of things, rubbish for the most part, but often good utensils too; all used to be secreted in the underground camp. She never talked to anyone, but used to mutter continually to herself and her dogs in an unknown tongue which only her dogs seemed to understand.
>
> We thought she was quite mad.
>
> One day, while we were playing tennis, she suddenly, muttering her strange language and dancing new corroboree steps, clad only in her black skin, came up. Matah told her to go away, but she only corroboreed round him and said she wanted to see

me. . . . She danced round me for a little time, then sidled up to me and said:

"Wahl [negative or "no"] you frightened, wahl me hurt you. I only womba—mad—all yowee—spirits—in me tell me gubbah— good—I lib 'long a youee: bimeby I come back big feller wirreenun [as a medicine woman] wahl you frightened? I not hurt you."

And after crooning an accompaniment to her steps, off she went, a strange enough figure, dancing and crooning as she went towards her camp; and not until the spirits gave up possession of her did she come near the house again.

I used to tell the other blacks to see that Bootha had plenty of food. They said she was all right, the spirits were looking after her. Lunatics, from their point of view, are only persons spirit-possessed.

Gradually old Bootha, clothed as usual, came back about the place.

Strange stories came through the house back to me of old Bootha. She was very ill for a long time, then suddenly she recovered, not only recovered but seemed rejuvenated. We heard of wonderful cures she made; how she always consulted the spirits about any illness; how there were said to be spirits in some of her dogs; how she was now a rainmaker, and, in fact, a fully fledged witch.

The reader will note a typical Western attitude toward the "lunatic," a blend of amused contempt, pity, and anxiety, and also the native woman's awareness of the attitude, and her effort to clarify the white man's misunderstanding by explaining that her hallucinatory experiences were "good." Noteworthy also is the satisfactory (both to the woman and to her associates) social remission, which was achieved in the course of becoming a shaman: a remission which, I suggest, was facilitated by her anxiety-free acceptance of hallucinatory experience. This anxiety-free acceptance of, and willingness to describe, hallucinatory experience contrasts vividly with the common shamed, fearful, self-doubting attitude of Western patients, who frequently try to conceal the fact that they "see things" or "hear voices," and sometimes "confess" (as the psychiatrist puts it) to hallucinations only under very careful questioning.

Response to hallucination may be considered both as a matter of the hallucinator's response to the experience and as a matter of the response of his group (and the two, of course, may be equivalent). As I have indicated, in primitive societies the fact of hallucination per se is seldom disturbing; but the content itself may be disturbing or not, depending on the nature of the socially appropriate response. Dreamers or visionaries may resist strenuously the hallucinated suggestion that they undergo an arduous process of becoming a shaman, or that they accept the role of *berdache* (an institutionalized inversion of sexual role among the Plains Indians), or that they commit some act, like murder or incest, which violates social norms; they may be stricken with panic at learning of approaching community disaster, or that they have been bewitched, or that they will be captured, tortured, and killed in a future war. Similarly, the hallucinator's associates may respond with dismay, or with enthusiasm, to the wishes of his soul, and may institute protective measures to avert harm from him or from themselves, may induct him into the special social relationships indicated by his vision, may conduct the indicated medical treatment, or may take his revelation as a code for social reform. The significant point is that it is the content of the communication which is the focus of interest and the fulcrum of action rather than the fact of hallucination itself.

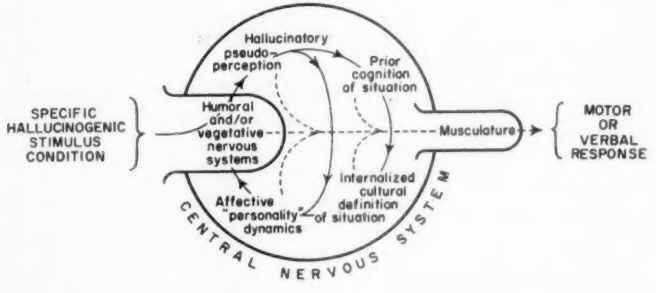
Let us now consider, by contrast, the responses to hallucination typical in Western societies. In some social groups, particularly religious sects, hallucinatory experience with supernatural figures apparent in the manifest content is interpreted as divine, or Satanic, revelation, and is responded to either by acceptance of injunctions discovered in the content or by repression, or even punishment designed to drive out "possessing" devils. In psychoanalytically influenced groups (which probably include a considerable proportion of the urban population of Western countries), dreams are interpreted and used as a basis for psychotherapeutic action, but waking hallucinations are regarded as symptoms of serious psychic illness. And in the rest of

the population at large, waking hallucinations are probably regarded primarily as indications of "nervous breakdown," or even "insanity." The latter unfavorable social diagnosis is very commonly followed by the social extrusion of the hallucinator, with or without prior medical advice, into a mental hospital or some other socially restricted environment, or at the very least into a quasiostracism at home or in lodgings. Police force is available and not uncommonly used to sanction and to effect this extrusion. In medical circles, despite recognition that hallucination in many conditions is a secondary symptom, and despite the insistence of workers like Boisen that "what the voices say is the important thing, not the mere fact of hearing voices," [1] hallucination is commonly taken to be a grave sign. In some of the research literature, indeed, hallucination is treated as if it were the essential feature of psychosis.

Now it is reasonable to suppose that most persons, when they hallucinate for the first time (certainly when the first waking hallucination occurs), are aware of the culturally standard interpretation of and response to hallucination in their society. Even if they do not accept this interpretation and response as wise or proper, they will be aware of its probable evocation in others. If this is the case, then it is likely that the person's interpretation of, and response to, the *fact* of his own hallucination in a given context (as well as its content) will be a function of the way in which the fact (and content) of hallucination is defined by his culture. The function should determine in part his emotional experience both during and after the event, and possibly (by cultural suggestion) its perceived content as well.

We may ask, at this point, how much anxiety, self-depreciation, and cognitive distortion are added to the miseries of mental patients by the circumstance that they have learned to fear waking hallucination in the course of living in a society in which waking hallucinatory experience is almost uniformly negatively valued? (The scientific validity of the valuation is irrelevant.) Furthermore, we must question the completeness of any research into the psychophysiological action of the so-called psychomimetic drugs, of sensory restriction, and of other hallucinogenic procedures which fails to weigh not only the magnitude but also the direction of the probably massive contaminating effect of cultural suggestion upon the subjects. For what is measured is not just the action of a drug or other procedure, but the action of the procedure plus the subject's interpretation of and response to this action, plus the feedback effect on the continuing action itself (Figure); and all of these actions, interpretations, responses, and effects are factors with direction, as well as magnitude.

There may be much that the therapist can do to alter the internalized cultural definitions of hallucinatory experience in his patients, if he wishes. But it is research problems that chiefly concern us here. It would be possible in clinical research to control for the direction of cultural effects by employing as control subjects persons whose subculture differs sharply from that of the




Mediation of response to hallucinogenic stimulus by facets of subjective experience.

experimental subjects in its definition of the expected experience, and by ensuring that the experimental conditions for the controls were sufficiently close to culturally normal conditions *for them* to permit generalization from past learning. Furthermore, it would be possible to select subjects systematically on criteria of personality, of past experience, and of attitude toward the expected events; and it would be possible to vary deliberately the general situational structure with other variables held constant, both by physical manipulation and by deliberate instruction and suggestion to the subjects. Such procedures, incidentally, should also be considered in relation to other than hallucinogenic compounds; they evidently would apply to such drugs as tranquilizers, sedatives, and energizers, which on other evidence also depend in part for their effects on relatively unexplored interactions with personal dynamics and sociocultural milieu.[18] Methodologically, such manipulations are the reverse images of the controls imposed by the placebo-and-blind (or double-blind) techniques and of analysis-of-variance techniques involving multiple pharmacologic agents; whereas the placebo-plus-blind, or variance-analysis, design varies the chemical agent and holds situation constant either by randomization or by laboratory control, the method of cultural and situational controls would hold the drug constant and vary such aspects of situation as the physical experimental conditions, instructions to personnel, and character and background of subjects. Drug and cultural controls should ideally be combined in one design.

## Summary

The paper briefly examines the range of cultural variation in conditions inducing, interpretations of, and responses to, hallucinatory experience. The published data suggest strongly that internalized cultural definitions of hallucinatory experience have a profound effect on the responses both of mentally ill and of normal persons. Methodological controls for cultural differences are indicated in research with hallucinogenic substances.

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# Some Neurophysiologic Aspects of Depressed States

*An Electromyographic Study*

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The neurophysiologist has become interested in exploring the possibility that functional disorders may be basically a disturbance in the interaction of neurons, particularly the neurons of that complex network composing the brain. These neurons need not be structurally abnormal. Instead, they can be normal neurons that have learned to fire off in spatiotemporal patterns detrimental to the organism. Neurons do affect each other, and there are indications that activity within the motor portion of the nervous system can have pronounced effects on activity elsewhere in the nervous system (Refs. 2, 13, 15, 17, 18, 20, 22, 23, 24, 27, 30, 32, 38, 41, 50, 51, 56, 66, 67). On the basis of such studies, as well as from other findings, numerous investigators have come to believe that motor activity is more than just an end-product of psychic activity (Refs. 3, 5, 8, 9, 14, 21, 29, 34, 39, 40, 47, 48, 49, 60, 62). There is evidence that thinking itself is in part a motor act, that maintenance of the waking state is partly dependent upon motor activity, and that feelings and emotions likewise are intimately tied up with motor states (Refs. 1, 4, 5, 7, 21, 31, 35, 36, 47, 48, 49, 56, 59, 60, 61, 62).

In the present study, residual activity in the motor portion of the nervous system was measured electromyographically in patients and control subjects while they endeavored to relax as completely as possible. Residual motor activity is for the most part invisible to the naked eye.

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This study was conducted at Eastern State Hospital, Medical Lake, Wash.

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## Apparatus

In order to study these low levels of resting activity in the motor portion of the nervous system by electromyographic methods, it was necessary to design and construct an instrument that would give suitable readings. This instrument was patterned after the integrating neurovoltmeter described by Jacobson[25,26] but is different in certain significant respects. It has been described previously.[64]

The instrumentation requirements of this investigation were primarily to pick up, amplify, and indicate the muscle action potentials located on the surface of the skin. One read-out was to be an indication of the instantaneous level of activity. In addition, an integrator must accumulate the potential for a definite period of time so that it may be recorded periodically.

The weakest electrical signal that can be detected is always limited by the noise level in the first stage of the amplifier. As we were interested in measuring voltages at as low a level as possible, it was of the greatest importance to design a preamplifier with great care.

Thermal noise in the first vacuum tube may be considered the only source of noise over which we have no control. Other sources of noise are, of course, the same as those experienced in all EEG and EMG recording, such as 60-cycle power-line pick-up. Standard techniques for eliminating this interference were carefully observed.

To maintain the most favorable signal-to-noise ratio, the frequency response of the amplifier was restricted to what was found to be an optimum band width. The frequency response of the entire system is from 120 to 300 cps at the 3 db. points, with a low-end slope of 12 db. per octave and a high-end slope of 8 db. per octave.

In order to drive a d. c. meter, the signal is full-wave rectified. A common back-bias technique in the meter circuit enables the meter to be set at zero when only the amplifier noise is present, this being done with the electrode leads shorted together. A similar back-bias technique is used in the integrator circuit. This procedure amounts

to a further reduction of the noise level. The noise level with no back-biasing is about 0.3μv. equivalent at the input, and the effective noise level remaining after back-biasing of the meter is about 0.1μv.

An R-C integrator was used with a linear range of more than a minute. The recorder, which is a multiple-point printer, samples and records the potential on the integrator, and immediately thereafter trips a reset relay, which shorts out the integrating capacitors.

Arbitrary periods of one minute were used as the integration time. Several signal channels may be used with one recorder, and the present work was done with four channels, one recording every 15 seconds.

Four amplifier channels and the recorder were mounted in a 19-in. relay rack, except for the four read-out meters, which were in individual containers to be located in strategic places for monitoring purposes.

## Method

All subjects lay in the supine position on a bed, in a semidarkened, relatively quiet room. They were instructed to relax as completely as possible and leave their eyes closed.

Residual motor activity, which is for the most part invisible, was measured electromyographically from four different motor regions simultaneously for a period of 30 minutes. The motor regions selected for this study were the forehead, jaw-tongue, forearm, and leg. Surface pick-up electrodes were arranged in pairs, since the amplifiers were double-ended. A ground electrode was placed a few inches away from each pair of pick-up electrodes. For the forehead readings, a small silver electrode, measuring 1.8 cm. in diameter, was placed in the midline over the frontalis muscle, and another was placed over the left corrugator muscle. For the jaw-tongue readings one of the same silver electrodes was placed in the submental region, and a Sanborn EKG electrode (measuring 3.2 by 5.1 cm.) was placed over the left masseter muscle. Anatomical considerations, as well as experimental tests, indicated that this pair of electrodes recorded not only from jaw-closing and jaw-opening muscles but also from some of the muscles controlling the tongue. For the forearm readings, one EKG electrode was placed over the extensor surface and another over the flexor surface of the right forearm. For the leg, one EKG electrode was placed over the anterior tibial muscle and the other over the gastrocnemius of the left leg. With electrodes paired in this fashion, activity beneath one or the other or both of a pair of electrodes would give readings. At the end of the test period, the subjects were questioned to determine various subjective experiences, such as whether they slept, whether they were in any pain or discomfort, whether they felt calm and relaxed or were nervous and restless, whether they were fearful, and what they could recall having thought about during the test period.

Two groups of depressed patients were studied, and each was compared with a control group. The first group consisted of six depressed patients who were retarded to the point of being mute or almost mute. Their movements were extremely slow, and, if left alone, they would sit or lie for hours almost motionless. They refused to eat but sometimes could be spoon-fed. They were all female, and their median age was 66, with an age range of 57 to 70. They were considered to have functional depressions because of the history and findings on examination and because they responded so well to treatment. The control group against which these patients were compared was matched for sex and approximately for age, the median age being 66 and the age range 53 to 76. The requirements for the control group were that they be reasonably well adjusted and that they should never have been mentally ill (psychotic).

The second group studied consisted of 13 depressed patients who did not exhibit the extreme motor retardation shown by the first group (Table 4). Five of them were a little retarded (Patients 1, 5, 6, 7, and 13); three of them exhibited agitated depressions (Patients 2, 4, and 12), and the remaining five were in between, being neither agitated nor retarded (Patients 3, 8, 9, 10, and 11). All of them were rather severely depressed, as determined by report from the patient and the conclusions of examiners. These patients were all female; their median age was 52, and the age range 26 to 62. Any patients for whom there was a question of the process being basically schizophrenic were excluded from the study. The control group against which these patients were compared was matched for sex and approximately for age, the median age being 52 and the age range 23 to 67. The requirements for the control subjects were the same as those stated above for the first group of control subjects.

Each electromyogram consists of 120 points arranged on a piece of graph paper along a time axis of 30 minutes, one point being plotted every 15 seconds. A sample EMG has been given in a previous paper.[64] The points are further arranged in four groups of 30 each, each group of 30 giving measurements from a specific motor region. The position of each point along the vertical axis of the graph gives the integrated quantity of motor activity for the preceding minute for that particular motor area. This integrated quantity is approximately the mean value of the motor activity for that minute. It is expressed in "units of motor activity," although with extra calculations

it could have been expressed in microvolts rms (root mean square). The "unit of motor activity" is an arbitrary unit obtained by dividing the vertical axis of the graph paper into 100 subdivisions. For the reader who prefers these values expressed in microvolts, the approximate conversion figures are as follows: 25 units of motor activity equals 1$\mu$v. rms, 55 units of motor activity equals 2$\mu$v., and 85 units equals 3$\mu$v. The instrument was calibrated both at the start of the period and at the end with a 1$\mu$v. rms signal at 200 cycles per second, and at the end of the period with 2$\mu$v. and 3$\mu$v. signals as well.

Each individual EMG was processed as follows: From the 30 points printed on the graph paper for each motor region, a mean value was calculated. Values going off the top of the graph were assigned a value of 100 units, since this is the highest point on the graph. From the mean values for each of the four muscle areas a grand mean was calculated. This grand mean, therefore, is a single number giving the mean quantity of motor activity from all sources for the entire 30-minute period.

For both patient groups and both control groups various mean values were calculated, as will be shown in detail in the section on results. The significance of each of these means was determined in accordance with the method described by Fisher.[12] For the reader not familiar with the concept of the significance of a mean, this determination basically is answering the question: "On the basis of the distribution of samples already obtained, what is the probability that a larger number of samples will give a different mean?" This probability can be calculated accurately and makes it possible to determine when a population sample is large enough to be representative of the population in question. In addition to the significance of means, the significance of the difference between means of the patient and that of the control group was also calculated.

TABLE 1.—*Mean Values of Motor Activity and Significance of the Means for the Depressed Patient Group Exhibiting Extreme Motor Retardation*

| Patient | Brow Mean, Units | Jaw-Tongue Mean, Units | Forearm Mean, Units | Leg Mean, Units | Grand Mean, Units |
|---|---|---|---|---|---|
| 1 | 100.00 | 100.00 | 74.49 | 72.43 | 86.7 |
| 2 | 81.52 | 93.60 | 49.98 | 65.78 | 72.7 |
| 3 | 61.88 | 99.91 | 37.78 | 47.97 | 61.9 |
| 4 | 83.92 | 99.48 | 100.00 | 100.00 | 95.9 |
| 5 | 57.82 | 100.00 | 86.87 | 23.71 | 67.1 |
| 6 | 66.95 | 98.49 | 31.80 | 37.09 | 58.6 |
| Group mean | 75.35 | 98.58 | 63.49 | 57.83 | 73.8 |
| *t*-value | 11.58 | 98.60 | 5.62 | 5.21 | 12.30 |
| *P*-value | <0.001 | <0.001 | <0.01 | <0.01 | <0.001 |

TABLE 2.—*Mean Values of Motor Activity and Significance of the Means for the Control Group Matched to the Patient Group of Table 1*

| Subject | Brow Mean, Units | Jaw-Tongue Mean, Units | Forearm Mean, Units | Leg Mean, Units | Grand Mean, Units |
|---|---|---|---|---|---|
| 1 | 58.13 | 59.75 | 10.91 | 7.21 | 34.0 |
| 2 | 98.14 | 60.17 | 19.32 | 5.11 | 45.7 |
| 3 | 36.86 | 63.20 | 26.42 | 8.43 | 33.7 |
| 4 | 54.27 | 74.71 | 27.34 | 14.32 | 42.7 |
| 5 | 19.39 | 71.87 | 2.91 | 10.13 | 26.1 |
| 6 | 23.92 | 51.21 | 21.07 | 6.07 | 25.6 |
| 7 | 42.77 | 93.98 | 16.19 | 2.55 | 38.9 |
| 8 | 17.70 | 56.73 | 22.48 | 12.94 | 27.5 |
| 9 | 56.07 | 50.32 | 18.10 | 26.87 | 37.8 |
| Group mean | 45.25 | 64.66 | 18.30 | 10.40 | 34.7 |
| *t*-value | 5.39 | 14.38 | 7.32 | 4.33 | 14.46 |
| *P*-value | <0.001 | <0.001 | <0.001 | <0.01 | <0.001 |

## Results

Table 1 shows the composition, various mean values, and the significance of the means for the first group of depressed patients, namely, those who were extremely retarded to the point of being mute or almost mute. Table 2 shows corresponding information for the matched control group. Figure 1 shows composite EMGs for this control group and patient group. Each point on these graphs is the mean of the entire group for that particular minute and that particular motor region, and the points are plotted minute by minute for a 30-minute period. Table 3 gives a quantitative comparison of this control group and patient group and shows the significance of the differences between them.

TABLE 3.—*Comparison of Depressed Patient Group Exhibiting Extreme Motor Retardation with Its Matched Control Group, Showing the Significance of the Differences*

| | Brow Mean, Units | Jaw-Tongue Mean, Units | Forearm Mean, Units | Leg Mean, Units | Grand Mean, Units |
|---|---|---|---|---|---|
| Depressed group (Extremely retarded) | 75.3 | 98.6 | 63.5 | 57.8 | 73.8 |
| Control group | 45.3 | 64.7 | 18.3 | 10.4 | 34.7 |
| Difference | 30.0 | 33.9 | 45.2 | 47.4 | 39.1 |
| *t*-value | 2.57 | 5.91 | 4.71 | 5.04 | 6.94 |
| *P*-value | <0.05 | <0.001 | <0.001 | <0.001 | <0.001 |

For both control and patient groups, the mean values for the individual motor regions and for the grand means are highly significant. The differences between control and patient groups with respect to the jaw-tongue area, forearm, leg, and grand means are also highly significant ($P<0.001$). For the brow areas the difference is significant, but not to such a high degree as that for the other motor areas ($P<0.05$). Of the various motor areas measured, the most highly significant difference lay in the jaw-tongue means ($t$-value$=5.91$). The difference in grand means was 39.1 units of motor activity, the control group giving 34.7 units of motor activity and the patient group 73.8 units.

Another relationship present in the data and worthy of mention is that the rank order of the four motor areas is the same for both control and patient groups, but the patient group is set at a higher level. For both groups the jaw-tongue area exhibits the greatest motor activity, the forehead is next, the forearm is next, and the leg area exhibits the least motor activity.

Still another relationship to be pointed out is that there is no overlap in the ranges of the grand means of the two groups. For the leg means, one patient value overlaps the upper end of the range for the control values. There is no overlap in the forearm values. For the jaw-tongue means, one patient value just barely overlaps the values for the control group. For the forehead means, one patient value barely overlaps the control range.

Table 4 shows the composition, various mean values, and the significance of the means for the second group of depressed patients, those *not* exhibiting the extreme motor retardation of the first group of depressed patients. Table 5 gives corresponding information for the matched control group. Figure 2 shows composite EMGs for the control group and the patient group. As mentioned earlier, each point on the composite EMG is the mean of the entire group for that particular minute and that particular motor region. Table 6 gives a quantitative comparison of the control group and the patient group and shows the significance of the differences between them.

For both control and patient groups the individual motor area means and the grand means are highly significant, indicating that the samples are representative of the population in question. In all of these mean values the patient group runs considerably higher

TABLE 4.—*Mean Values of Motor Activity and Significance of the Means for the Depressed Patient Group* Not *Exhibiting Extreme Motor Retardation*

| Patient | Brow Mean, Units | Jaw-Tongue Mean, Units | Forearm Mean, Units | Leg Mean, Units | Grand Mean, Units |
|---|---|---|---|---|---|
| 1 | 40.06 | 56.95 | 2.55 | 1.47 | 25.3 |
| 2 | 22.05 | 97.97 | 10.59 | 8.43 | 34.9 |
| 3 | 23.70 | 58.09 | 30.94 | 4.71 | 29.4 |
| 4 | 42.81 | 70.48 | 32.35 | 53.46 | 49.8 |
| 5 | 95.52 | 100.00 | 42.51 | 5.32 | 60.8 |
| 6 | 23.02 | 97.02 | 46.70 | 38.48 | 51.3 |
| 7 | 55.28 | 82.60 | 8.07 | 13.52 | 39.9 |
| 8 | 17.80 | 41.16 | 6.03 | 3.33 | 17.1 |
| 9 | 95.48 | 100.00 | 66.93 | 25.57 | 72.0 |
| 10 | 95.05 | 82.95 | 86.55 | 72.63 | 84.3 |
| 11 | 62.40 | 84.79 | 15.77 | 32.29 | 48.8 |
| 12 | 38.64 | 88.29 | 28.46 | 6.02 | 40.4 |
| 13 | 23.04 | 79.76 | 9.13 | 7.18 | 29.8 |
| Group mean | 48.83 | 80.00 | 29.77 | 20.95 | 44.9 |
| $t$-value | 5.95 | 15.69 | 4.20 | 3.39 | 8.47 |
| $P$-value | <0.001 | <0.001 | <0.01 | <0.01 | <0.001 |

TABLE 5.—*Mean Values of Motor Activity and Significance of the Means for the Control Group Matched to the Patient Group of Table 4*

| Subject | Brow Mean, Units | Jaw-Tongue Mean, Units | Forearm Mean, Units | Leg Mean, Units | Grand Mean, Units |
|---|---|---|---|---|---|
| 1 | 54.27 | 74.71 | 27.34 | 14.32 | 42.7 |
| 2 | 42.77 | 93.98 | 16.19 | 2.55 | 38.9 |
| 3 | 19.39 | 71.87 | 2.91 | 10.13 | 26.1 |
| 4 | 23.92 | 51.21 | 21.07 | 6.07 | 25.6 |
| 5 | 17.70 | 56.73 | 22.48 | 12.94 | 27.5 |
| 6 | 56.07 | 50.32 | 18.10 | 8.58 | 33.3 |
| 7 | 19.65 | 59.04 | 3.48 | 3.33 | 21.4 |
| 8 | 47.95 | 51.97 | 5.57 | 25.36 | 32.7 |
| 9 | 17.39 | 35.47 | 1.33 | 0.40 | 13.6 |
| 10 | 40.84 | 38.12 | 12.31 | 6.08 | 24.3 |
| 11 | 35.70 | 38.37 | 13.66 | 6.80 | 23.6 |
| 12 | 47.50 | 67.45 | 10.91 | 2.21 | 32.0 |
| 13 | 25.61 | 26.56 | 0.28 | 2.98 | 13.9 |
| Group mean | 34.52 | 55.06 | 11.97 | 7.83 | 27.4 |
| $t$-value | 8.63 | 10.60 | 4.80 | 4.11 | 11.42 |
| $P$-value | <0.001 | <0.001 | <0.001 | <0.01 | <0.001 |

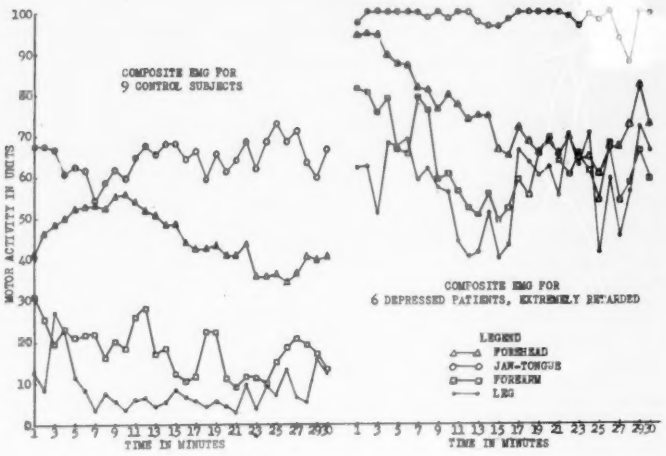


Fig. 1. — Composite EMGs for the patient group exhibiting extreme motor retardation and its matched control group. Each point on the graph is the mean of the entire group for that particular minute.

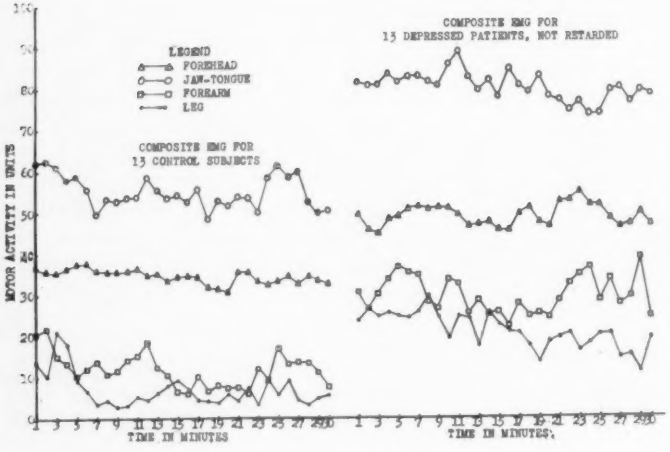


Fig. 2. — Composite EMGs for the patient group *not* exhibiting extreme motor retardation and its matched control group. Each point on the graph is the mean of the entire group for that particular minute.

TABLE 6.—*Comparison of Depressed Patient Group Not Exhibiting Extreme Motor Retardation with Its Matched Control Group, Showing the Significance of the Differences*

| | Brow Mean, Units | Jaw-Tongue Mean, Units | Forearm Mean, Units | Leg Mean, Units | Grand Mean, Units |
|---|---|---|---|---|---|
| Depressed group (not retarded) | 48.8 | 80.0 | 29.8 | 21.0 | 44.9 |
| Control group | 34.5 | 55.1 | 12.0 | 7.8 | 27.4 |
| Difference | 14.3 | 24.9 | 17.8 | 13.2 | 17.5 |
| *t*-value | 1.56 | 3.42 | 2.37 | 2.04 | 3.01 |
| *P*-value | >0.10 | <0.01 | <0.05 | 0.05 | <0.01 |

than the control group. The differences are significant for the jaw-tongue area, the forearm, the leg, and the grand mean but not for the forehead. (The leg differences are just barely significant, the *P* value being slightly above 0.05). For the individual motor regions the greatest difference between groups (24.9 units of motor activity) and the greatest significance of difference ($P<0.01$) lay in the jaw-tongue area. The difference in grand means was 17.5 units of motor activity, the control group giving 27.4 units and the patient group 44.9 units.

The rank order of the four motor areas is the same for both the control and the patient group, the patient group being set at a higher level. This can be seen most clearly in Figure 2, which gives composite EMGs for the control and the patient group.

For both groups of depressed patients in the present study, elevation of jaw-tongue motor activity over that for the control groups exhibited the greatest level of significance statistically as compared with the other motor regions studied.

## Comment

The results of the present study indicate that whether depressed patients are agitated or retarded their invisible residual motor activity runs at abnormally high levels. In fact, patients who are extremely retarded give higher readings than those who are not.

The term "hyperponesis" has previously been suggested to refer to a state of hyperactivity or hyperreactivity in neurons composing the motor portion of the nervous system, that is, the portion extending from the motor and premotor cortex to the peripheral musculature.[64] This exaggerated activity may be localized to a portion of the motor system or generalized to include the whole motor system. It may be intermittent or continuous, static or phasic, overt or invisible.

Whether hyperponesis can play some type of etiologic role in the production of depression or is a consequence of the disorder is an important question. Although we often think of motor activity in mental illness as being secondary to psychic processes, the reverse possibility is a real one when it is invisible motor activity to which we refer. Also, the invisible motor activity studied in this investigation (which exists unbeknown to the person) may not follow the same laws as overt motor activity. Neuroanatomic and neurophysiologic considerations make it reasonable that hyperponesis may play some role in the production of depression. Neurons composing the motor portion of the central nervous system give off many collateral fibers (both before and after they leave the cerebral cortex), with potentialities for producing effects in distant portions of the nervous system. Distant effects can also be mediated by afferent impulses originating in proprioceptors as a result of motor activity. The limbic system, which has come to occupy an important position in emotional experience,[42,43,52] could easily come under the influence of these motor neurons, as also could various parts of the neopallium, which seems to be more important in ideational processes.[6,11,43,53] There is reason to believe that emotion and thinking, as well as the waking state itself, are intimately tied up with motor activity (Refs. 1, 4, 5, 7, 21, 35, 36, 47, 48, 49, 56, 59, 60, 61, 62). There are also indications that depression is basically a spatiotemporal pattern of activity in neurons [54,63] and that neurons within the limbic system occupy an important position in this pattern.[42,43,52] This being the case, it would not be hard to understand how hyperponesis might produce disturbances of emotion. By means of excitatory and inhibitory influences exerted through the pathways described above, hyperponesis could disturb habitual spatiotemporal patterns of activity within the nervous system and give rise to patterns constituting depression, or at least predispose the person to such patterns. Fatigue of neurons consequent to hyperponesis may also enter the picture.[10] As the invisible hyperponesis becomes more intense, it could affect directly the output of overt motor activity by a feed-back mechanism, producing extreme overt motor retardation.[57] This sort of explanation is compatible with Kraines' hypothesis that manic-depressive illness is basically a reversible physiologic dysfunction in the diencephalic-rhinencephalic-reticular systems and that the psychopathology found in this disorder is secondary to the physiologic disturbance.[37]

Clinical studies suggest that hyperponesis can play an etiologic role in the production of depression. Techniques have been developed for teaching patients to deactivate their motor systems, that is, turn off in-

visible residual motor activity to an extreme degree (Refs. 14, 19, 21, 27, 29, 30). The pedagogic principles involved have been subjected to rigid tests, and it has been shown that the training procedure, and not some extraneous factor, brings about the electromyographically measured reduction in motor activity.[19,28,29] When depressed patients are taught by these methods to recognize and regulate their invisible motor reactions during daily activities, their difficulty with feelings of depression is reported to diminish or disappear in proportion to the degree of skill they have acquired.[9,21,27,30,31] That invisible motor activity can have effects on nervous system function is further indicated by laboratory studies demonstrating the effects of motor deactivation on physiologic processes. For example, the knee jerk is reduced or abolished.[32] The startle reaction to a sudden unexpected sound behaves likewise.[18,41] The flexion reaction to a painful stimulus is diminished in magnitude or abolished, and reaction time is lengthened.[50] Smooth muscle tonus is reduced,[17] as are also blood pressure and heart rate.[20,22,23,24] Mental activities (thought processes, emotion, attention) diminish when motor deactivation is marked and cease for intervals during which motor deactivation is approximately complete.[21] Other studies have recorded changes in other types of bodily processes.[51]

Although hyperponesis may play an etiologic role in the production of depression, other etiologic forces, too, will be operative, such as inherited constitutional factors, personality structure, and environmental situations. The concept of necessary and sufficient conditions and of plurality of causation might find sound application in the solution of this problem.

There is growing interest in hyperponesis and in determining its role in the neurophysiology of functional disorders in general. Jacobson considers hyperponesis to be so fundamental in the etiology of functional disorders that unless it is overcome the patient tends to remain ill, no matter what the therapy.[21,27,28,31] He has developed methods of attacking directly the patient's invisible motor reactions by a program of motor reeducation.

Haugen refers to the entity hyperponesis, calling it a bracing reaction, and he expresses the view that without this bracing reaction no neurosis can develop, and that unless this bracing reaction can be permanently decreased or eliminated, the patient remains vulnerable to an exacerbation of his illness.[14] Holmes and Wolff refer to a pattern of motor behavior which they call the "on-guard" pattern, and state that when it is utilized as a way of life it may place an intolerable burden on the individual's emotional and physical equipment.[16]

Wolpe states that motor deactivation has autonomic effects antagonistic to those of anxiety.[66,67] He proposes that the neurophysiologic principle called reciprocal inhibition, whether carried out purposely or inadvertently, is the basic ingredient of many forms of psychotherapy. Regulation of motor activity, and the reciprocal inhibition consequent to it, is considered by him to be fundamental to the successful treatment of functional disorders.

Kretschmer believes that motor states can be important in the etiology of functional disorders. He has coined the term "induced regulation of tonus" for a method he uses in treating those disorders, whereby he works step by step on the voluntary musculature until autonomic changes take place. He believes this method to be applicable to all disorders which depend directly or indirectly on a disequilibrium of the autonomic centers and their endocrine connections.[38,39,40]

Garmany states that hyperponesis, once developed as a habit, can become the source of emotional disturbance and that motor reeducation can aid in the production of a relaxed mind.[13] Barlow presents evidence that motor reeducation is capable of producing quite fundamental changes in persons and can alter personal attitude and disposition.[2] He has found it to be of great value

in the treatment of psychosomatic disorders. The aim in his technique of motor reeducation is to teach the patient a basic "resting state" which he can maintain while engaged in his daily activities and which he can achieve even when under stress.

Dixon and co-workers refer to a person's tendency to react to threats and the intangibles of living with exaggerated motor activity as "guard," and they believe this guard to be capable of producing symptoms.[8,9] They believe that therapy, if it is to come to grips with fundamentals, must include training a patient to eliminate these exaggerated motor reactions. Plutchik, after reviewing the literature on the subject, concluded that chronic muscle tension is causally related to many physical complaints.[55] He suggested that a universal criterion of normality might be "freedom from chronic muscular tension." Numerous other investigators have also expressed an interest in the role of motor states in functional disorders (Refs. 33, 41, 45, 46, 58, 65).

If the two control groups of the present study are scrutinized more carefully and compared with the control group of a previous study,[64] some interesting, and perhaps significant, relationships will become evident. The three control groups are samples from different age populations. That group reported in the previous paper has a median age of 33 years. In the present study one control group has a median age of 52 years, and the other a median age of 66 years. The youngest of these three control groups gives a grand mean of 19.9 units of motor activity. The middle-aged control group gives a grand mean of 27.4 units of motor activity, and the oldest control group has a grand mean of 34.7 units. Each of the individual motor regions likewise shows an increase in activity as we progress from the youngest to the oldest control group.

This suggests that invisible residual motor activity tends to increase with age. Perhaps a majority of the subjects in the oldest control group should be considered already hyperponetic, even though they do not yet exhibit marked symptoms. It would help to explain the higher incidence of depressed states in older age groups. It might also help explain why the extremely retarded depressions studied in the present paper were in an older age group on the whole than the less severely retarded depressions. This type of explanation would consider hyperponesis to be one etiologic factor in the production of depression.

## Summary

Spatiotemporal patterns of activity in neuronal nets and disturbances in the interaction of neurons composing these nets may play an important role in the etiology of functional disorders. The neurophysiologist has become interested in exploring this possibility, and the present study is so oriented.

States of residual activity in the motor portion of the nervous system were measured electromyographically in two groups of depressed patients and the corresponding control groups. Residual motor activity is for the most part invisible. An electromyograph giving both integrated and instantaneous readings and capable of measuring minute amounts of motor activity was employed. Continuous measurements were recorded via four channels for 30-minute periods while the subjects endeavored to relax as completely as possible in the supine position. The four motor regions selected for study were forehead, jaw-tongue, forearm, and leg.

The first depressed patients studied, six in number, all had retarded depressions to the point of being mute or almost mute. Although these patients were immobile overtly, their invisible residual motor activity ran significantly higher than that for a control group in all four motor regions ($P<0.05$ for forehead and $<0.001$ for jaw-tongue, arm, and leg). The grand mean for the patient group was 73.8 units of motor activity and for the control group 34.7 units.

A group of depressed patients not exhibiting the extreme motor retardation of the first group also exhibited significantly elevated

invisible residual motor activity. The magnitude of the elevation was not so great as that for the more retarded patients. The greatest elevation and the greatest significance of difference were exhibited by the jaw-tongue area ($P<0.01$). The elevation of grand mean was smaller in magnitude but also significant at the 0.01 level. The forearm and leg elevations were less significant ($P<0.05$ for the forearm and just barely 0.05 for the leg), and forehead differences were not significant ($P>0.10$). The grand mean for the patient group was 44.9 units of motor activity and that for the control group 27.4 units.

For both groups of depressed patients the elevation of jaw-tongue motor activity exhibited the greatest level of significance statistically.

Hyperactivity in neurons of the motor portion of the nervous system has previously been given the name "hyperponesis." Whether hyperponesis can play some type of etiologic role in the production of depression is an important question. Neuroanatomic and neurophysiologic considerations make this a reasonable possibility. Clinical studies suggest that it can.

Present findings combined with previously reported data suggest that invisible motor activity tends to increase with age. Control groups in older age ranges give higher readings than those in lower ranges. If hyperponesis plays a role in the onset of depression, this finding would help explain why the incidence of depression tends to be higher in the older age groups of our population.

Norma Britton, Fern Lakey, Mina Michael, Bernice Pence, and Dorothy Vladmir assisted in preparing the subjects for electromyography. Dr. Theodore C. Ruch, Executive Officer of the Department of Physiology and Biophysics of the University of Washington, gave the assistance of his electronics staff (John Dudley and Dean Franklin) in the design and construction of equipment.

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# Problems of "Perception" and "Communication" in Mental Illness

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The establishment of the Albert D. Lasker Memorial Lectureship at the Institute for Psychosomatic and Psychiatric Training and Research of the Michael Reese Hospital signifies the coming of age of the multidisciplinary approach to research in psychiatry. It thus also signifies the sound development of a scientific—or operational—approach to the problems of human relationships and their chemical and functional-anatomical substrata. This Lectureship is thus a fitting tribute to a man whose insight and freedom from conventional pressures prompted him to support, and thus make possible, the Institute and its pioneering program. For those of us who were introduced to psychiatry some 40 years ago the advances made in the past 10 to 15 years are both breath-taking and thrilling. In view of the basic contributions to these recent developments by the research program of the Institute, I not only deeply appreciate the honor of having the opportunity to participate in this lecture series but also must note a certain trepidation at meeting the responsibilities this participation imposes. It has thus seemed desirable to consider with you a subject which is fundamental to behavioral research and to clinical practice, though one in which research methods are still being tested and operational formulation is not yet adequate.

The title selected for this paper provides a general indication of the area in question, but needs a note of explanation. The use of quotation marks limiting the significance of the terms *perception* and *communication* is to call attention to one of the major problems of the investigator in this field. Every person is so dependent on his sensations and feelings for directing even his simplest performances that he becomes convinced that his "perceptions" are innate functions, at least as reliable as his simplest "voluntary" acts. Insofar as he is a member of a reasonably closely knit social group, the behavior of his associates implies that their perceptions are essentially similar to his own, and inevitably a sense of the independent validity of perception extends to become a concretized general concept. So far as experimental data are available, however, our knowledge of another person's subjective phenomena or of the inferences he derives from them—and thus of "perception" in general—is dependent on cues, which are part of overt behavior. Conclusions as to what another person perceives are inferences from the messages he sends and the observer decodes.* Thus, one cannot operationally differentiate between "perceptions" and their "communication."

Apart from the truism that subjective phenomena cannot be directly communicated, the recent studies in the ethology of submammalian species—demonstrating certain innate capacities for reciprocally evoked

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* For the sake of completeness, it may be noted that the "observer" in a reciprocally evoked transaction, in addition to the information from his exteroceptor sensory system, is provided with data from his interoceptor system. The latter are usually decoded as "feelings," which largely represent undifferentiated anticipatory behavior (overt and covert) *as though* in preparation for a con-

*(Footnote continued on following page)*

transactions—raise the question as to whether equivalent or complementary covert (intracerebral) activity may occur in both members of the pair involved. This question is subject to direct examination by implanted electrodes and will no doubt be answered in the future. The problem in mammals is different, owing to their greater capacity for both variability and modifiability of behavior. Indeed, in the human it appears clear that even masculinity and femininity are learned as cultural gender roles and are not innate, excepting the limits imposed anatomically. The data on higher mammals, and particularly humans, emphasize the importance of small, intimate groups, such as families, and of "old friends." In such groups it is not only the reliability of the external social milieu that is significant. The reciprocally increased reliability of one's own anticipatory behavior is even more important. Knowledge of the anticipatory (or predictive) significance of symbolic communicative behavior in small, stable groups permits a refinement and richness of "feelings" which are not possible with strangers or in time-limited situations.†

The reciprocal nature of the maintenance of stability of personal transactions is emphasized in situations of psychological stress, as in working with disturbed patients or in dangerous situations where the question "Are you for me or against me?" is paramount. Incipient panic may supervene in an ambiguous communication, but may stop in response to simple direct information. Under such conditions, however, "feelings" are communicated by direct action or by words describing action, rather than by conventional adjectives.

For example, a colleague described an episode with one of his patients, a young woman in a disturbed, paranoid state. She had been upset by other events on the ward just preceding his time to see her. When he arrived, her face became distorted in an "expression of rage," and she rushed toward him, her "hands clawing," as though to "scratch his eyes out." He held out his hands "as if to invite and receive a small child" running to him. By the time the patient reached him her whole expression had changed. She came close, barely pressing against him, gently held his arms, and laid her head on his shoulder. Then, giving him an "utterly tender kiss" on the cheek, she moved away and walked slowly with him to her room. In describing the episode, my colleague noted: "Of course, she did not want to attack me. I knew *that*." He further emphasized her "tender and fond feelings," basing this conclusion in part on other experiences with this patient, but largely on his own responses evoked by the current, disturbed state of the patient, and confirmed, as it were, by the change of her behavior to a pattern of expression complementary to his own.

One of the major aspects of psychotherapy is said to be the process of enabling the patient to become "aware" of factors of which he was previously "unaware," in other words, to make the "unconscious" "conscious." Since there are no generally accepted, adequate criteria for classifying behavior as "conscious," these problems must still be dealt with in very general terms. However, it seems likely that an important function of psychotherapy for neurotic patients is to provide an opportunity for the patient to differentiate his rather global, obscure "feelings" (whether described as "pleasant" or "unpleasant") into more precise signs or indicators, clearly associated with particular life experiences, together with their results or end-states. Even

tinued course of the transaction, as determined by a variety of previous experiences and learned cultural roles. Such evoked "feelings" apparently are major factors in phenomena referred to as "intuition," "countertransference," "clinical judgment," and so forth. Current training programs for psychiatrists are largely directed toward stabilizing this evoked behavior in the patterns appropriate to the respective psychiatric schools of thought.

† It is not unusual, however, for great *"intensity"* (i. e., excluding differential operations on available data) of mixed feelings to occur in strange, limited situations.

if no more than this is accomplished, the patient is provided with indicators of his transactional patterns (which include the anticipated consummatory acts or states), and can thus more adequately select socially acceptable goals, with some expectation of reaching them. In three successive cases in which the patients suffered a series of infatuational relations (two heterosexual, one homosexual) all of which ended in moderately to severely disturbing episodes, considerable time was spent examining perceptual and behavioral correlates in early life with parents, siblings, etc., as well as other characteristics of the patterns. No appreciable change in behavior was apparent until it was discovered that a major component of the holistic, infatuational feeling of "being in love" was fear, as well as expectation of failure to perform adequately and responsibly in a current situation of importance to the patient's life career, such as a new job, moving out of the hospital, or graduating from a technical school. With this differentiation of perceived affect, the mode of the "in love" relationships changed from the previous, stereotyped, mutually interdependent pattern to one of attempting to develop interpersonal interest, consideration, and respect. Emphasis is here laid on the differentiation of the perceived affects on the basis of the hypothetical question: "Who am I, not only as a member of a family, but also now, as a member of an extended social group, with its temporal as well as spatial, structure?" Although the very early learned, informal social roles seem to be largely maintained throughout life, the manner in which they are used and integrated in more comprehensive patterns is modified chiefly by the current social context, as the subject recognizes it to be perceived by his current reference group. The consequent communication of coded sensory input, i. e., the consequent "perception" of the situation, appears qualitatively different at different times, depending on the external social milieu and the reference group. This general principle and the importance of the relation of the therapist to the significant reference group have been clearly demonstrated in combat psychiatry (Glass [1]) and in milieu therapy (Wilmer [2]). The problem needs further study, however, in the settings of clinic and office practice, as well as in the setting of psychiatric education.

The problem of "perception-communication" in work with psychotic patients is more complex and has only begun to be clarified in relatively recent years. It is not proposed here to discuss this problem in relation to manic-depressive states further than to note the discrepancy between the very convincing, conventional, emotional, mimetic behavior and the limited capacity for verbal description or differentiation of the associated subjective phenomena. The latter are expressed in vague generalities, such as "the situation," being "fine" or "bad," or as expressions of being "worried," "upset," "confused," "high," "down," or "dead." It is of interest that the subjective phenomena of the manic state are frequently said to be the same as those experienced when depressed.

The problems of communication with patients in schizophrenic states have been studied by an increasing number of therapists since the pioneer work of Kempf [3] and Sullivan.[4] The wide variety of forms of communication and of subject matter, or content, utilized by different therapists emphasizes the highly condensed nature of symbolic behavior in schizophrenic states and the extraordinary capacity of the patients to establish reliable communication with persons who indicate an interest (Rioch [5]). The data suggest that the changes (improvements) in symbolic behavior which have been described as occurring during treatment are chiefly related to a general factor—possibly such as the reliability of the physician-patient relationship—rather than to specific attitudes or interpretations. These studies on intensive psychotherapy indicate that a number of the earlier, generally accepted conclusions as to the

limited and distorted nature of "perception" in schizophrenic states need to be considerably modified. Scher,[6] 1957, has discussed certain theoretical and practical aspects of this problem, with particular attention to the significance to patients of "apparently negligible acts" of the physician and others in the daily routine of the wards. Szalita,[7] 1958, has also approached the problem from the standpoint of therapy and has described the implications of different patterns of communication of perception, with attention to both form and content.

It is now generally recognized that there are certain similarities in the communicative symbolic behavior—i. e., the "language"—of patients in schizophrenic states, patients with brain injury, children, dreams, myths, folklore, and, in general, of persons under a variety of forms of "stress," in which the nervous system is functionally impaired or is over- or underloaded. General, clinical observations have led to the concept of *two kinds* of "thinking," "language," etc. Thus, we have the primary process and the secondary process thinking of Freud[8]; the referential and the experiential modes of symbolic behavior of Sapir[9]; the syntaxic and the parataxic modes of interpersonal relations of Sullivan,[10] who later added a "nonverbal," prototaxic mode; the (ordinary) logic and the paleologic of von Domaros[11] and Arieti,[12] and so forth.

The extensive, detailed studies of the communicative, symbolic behavior of brain-injured patients which have been conducted by Weinstein and his associates[13-18] during the past several years have greatly extended our knowledge in this field. It is quite clear that the changes in language pattern are well-integrated phenomena and are part of the current transactions of the patients. They are not merely loss of function, confusion, random behavior, or simple regression to childhood forms and problems. In a recent paper, Weinstein[19] has summarized the various changes of pattern of language which have been identified (disorientation, reduplication, confabulation, amnesia, etc.) and has pointed out their significance as adaptations to the stress of illness, as well as to the stresses arising from interpersonal problems of the patients in the current social context. In other words, the patient deals with current events in a modified form of symbolic behavior which employs *highly condensed, though apparently simple and concrete, symbols.* Weinstein's studies have also demonstrated that the selection of particular symbols, such as food, sex, health, or physical prowess, can frequently be shown to be related to preferred conventions (cultural roles) learned in early life as part of the preferred "language" pattern of the patient's family. In the modified symbolic behavior of the patients these conventional terms, clichés, or roles are used analogically or metaphorically for symbolizing (conceptualizing, communicating) current problems, and not for their common or dictionary referents. Longitudinal studies of patients with brain injury have shown that frequently the average (normal) mode of symbolic behavior is recovered through a series of steps, each of which shows decreased use of condensation, analogy, and metaphor and increased use of more commonplace modes of symbolic behavior. These findings indicate that we are dealing not with a "mixture" of two kinds of "thinking" or "language" but, rather, with varying degrees of capacity for processing data. The stepwise characteristic of recovery, as also the stepwise nature of the development of symbolic behavior (Inhelder and Piaget[20]), is probably related to the "symbol" existing as an organized pattern of neuronal activity, effectively present only when the whole pattern is present. (It is conceivable that incomplete, or partially organized, patterns may have indirect effects, even such effects as disrupting previously integrated patterns.)

Recent studies by Artiss and his associates[21] on milieu therapy for patients who developed their first psychotic episode during basic training in the Army indicate that the changes in communicative symbolic behavior are similar to those described by Weinstein. The extent to which the patients

communicate in "schizophrenese" is a function of the current anxiety they suffer, or of the anticipation of the onset of anxiety. Just as the fact of the illness is the major theme for the brain-injured patient, so the schizophrenic patient can be shown to have a "major message" which is related to the current social context of his life. The "major message" may be communicated in highly modified, metaphorical or analogical, condensed symbolic systems, but the over-all attitude of the patient to the "major message" is very practical. The difference between the tangential communication of and the practical attitude toward the "major message" is what Fromm-Reichmann [22] referred to as "talking with the patient as with a child" and "talking with the patient according to his chronological age." The major difference between the brain-injured patients and the patients in schizophrenic states is found in the implications of their communicative symbolic behavior. In the majority of the former the implied anticipations are for health, with the acceptance and assistance of the environment. In the latter the implied anticipations are for social isolation, through rejection by the environment, together with a variably impending threat of the onset of panic, with personal dissolution.

In order to illustrate some of the problems of "perception" and its "communication" in schizophrenic states, it is proposed to review a number of incidents with patients, together with illustrative interpretations. Emphasis will be placed on the use of varying degrees of the experiential mode of symbolic behavior as a part of the current personal transaction with the therapist in the particular situation, since every such situation is essentially unique. It should be noted here, however, that the interpretations to be presented are not necessarily *right*. The condensed symbols used are capable of several interpretations (Fromm-Reichmann [22]), any one of which might be *right* provided it implies respect for the persons concerned as human, and also expectation of reliable continuity.

A slim man in his early 20's, but appearing younger, was admitted to the hospital shortly after the symptoms of his first psychotic episode became manifest. He remained just to the side and behind his mother during the introduction to the physician, barely murmuring something when spoken to. The physician decided to take the patient directly to his room, leaving the mother to complete the prescribed formalities. He omitted the usual procedure of calling a nurse, as the patient appeared tense and disoriented. On arrival at the room, the physician led the way, the patient following hesitantly and stiffly. The patient stood awkwardly, just inside the door, his head slightly bowed. He glanced quickly and furtively at two or three objects. The physician walked slowly across the room, half-turned while looking out of the window, and said: "This is the window," and, after a pause: "You can see the garden from here." Then, crossing back across the room he said: "This is the door." After a pause, he continued: "That thing in the ceiling is the light"; pause, "it turns on here." At this point the patient walked over and sat down in the chair by the bed. He visibly relaxed. The charge nurse was brought in and introduced and a broken, but intelligible, conversation, providing for exchange or orienting information, started.

Now, states of disorientation are often interpreted as confusion and disorganization, with inability to recognize objects in the evironment or to recognize the significance of the situation. In the incident just cited, one might suspect that the patient was confused or that he was so preoccupied that contact with "reality" was lost. His rapid transition to conventional use of the furniture as though it were in "his room" suggests another interpretation. The theoretical basis for this interpretation is provided by Rignano,[23] in "The Psychology of Reasoning." Rignano pointed out that the *concept* of an object is essentially a working model of those aspects which serve certain human needs or purposes, or which arouse human interests or desires. Thus, the concept of a knife relates to a sharp edge for cutting, of a table as a flat surface to put things on, and so forth. Now, for the patient the question of the window is not, "What is that?" but, rather, "Will I be humiliated or rejected if I use (i. e., look out of) the window"; "if I go through the door," and so forth. When he was told,

"This *is* the door," he was also told by implication, "We expect you to use the door," and thus, "We accept you as a person—as one of us who use the door." Now whether this is *the correct* interpretation we do not know, since in this case the physician did not inquire later at a propitious time. Even if he had it is quite possible that the patient would have had amnesia for the event, since coming into a new situation is seriously disturbing; and, in the experiential mode of symbolic behavior, as Weinstein has shown, amnesia is a common form of communicating such disturbing characteristics. In the incident described the physician's verbal message was the same as his acted message and as the message of his verbal gestures, which consisted of short sentences, one idea per sentence, a moderately low, even tone of voice, denoting present action, and neither command nor question.

Another incident had a quite different course, owing in large part to errors in communication. Not long after I started working with psychotic patients, a young art student was admitted, and a day or two later I began seeing him. He had been becoming more and more disturbed after losing in a competition for a fellowship. He had modeled a figure "the way my teacher told me, but I guess I made it too tall." He talked rapidly, with a good deal of pressure, sketching in broad terms a variety of life experiences. His father was a contractor; one brother, an engineer; another in the Marines. He had had music and art lessons since about 7 years of age, in part urged on by his mother, but also on the basis of genuine ability and his own inclinations. These lessons took the place of sports, etc. On one occasion he told hurriedly that at the age of 6 there was an episode with a man, who "led him by the hand into the basement of an empty house." No details were described, but mention of the event was accompanied by a gesture of horror, somewhat overexpressed in comparison with his other behavior. He spoke of a trip to Europe with the family when he was 12 to 14, and emphasized a rehabilitation center for prisoners in Russia and how much better it was than prisons. It was not clear whether he had heard of, read of, or seen this center, since many of his descriptions were typically dreamlike, emphasizing people's attitudes to others in situations involving authority and force.

At that particular time I was much impressed by the theory of permissive treatment, including the principle that a mental hospital was a place where one could express oneself, rather than repressing and trying to deny inevitable tendencies. I had spoken of this twice, in general terms and in what I thought was an encouraging manner, in response to some rather bitter expressions of hopelessness. The next day he stayed in bed; and when I went to see him, he turned sharply toward the wall. For some time he lay silent and did not respond to several questions. Suddenly he began pounding the wall with his fist and swearing through clenched teeth. I remained silent, and after a time he subsided, but did not speak. The silence continued, and after the appropriate duration of the interview I left. Later that day he became more disturbed and was put in a seclusion room.

I have always been grateful to that patient for hitting the wall instead of hitting me. At the time I was perturbed, and the interpretation by my colleagues—intending to be comforting—that this was transference, and the patient did not hate me, was not particularly useful. I have since found that "transference" phenomena, although they may resemble in form or content documented or fantasied past events, are, 9 times out of 10, evoked by environmental contingencies, including my own performances. The 10th time they may be set off by a "distorted" interpretation of a word, a statement, a movement, or a gesture. However, I have learned more about the probably correct (and the certainly possible) implications of my behavior by assuming that transactions with patients are in the here and now. This assumption forces attention to examining the problem and working out with the patient the threat in the situation—rather than focusing on the defense symptoms and their history, and thus occluding awareness of major anxieties by attention to minor ones.

In the incident we are considering, the patient worked out the problem, though I did not formulate an interpretation of it myself until I reviewed it much later in the light of data provided by other patients in other experiences. For a week the patient remained nude and secluded in his room. I saw him daily and sat in a slumped posture on a chair just inside the door in order to imply as little intention of intrusion, threat, or challenge as possible, but indicating interest in maintaining contact. I was acutely uncomfortable and stayed only for 20 to 30 minutes, inhibiting any movement in response to his leaps, screams, and charges at me, which stopped within inches of hitting me. On one occasion a nurse came in to give him a sedative while I was there. He turned to her quietly and took the medicine as if I were not present and then turned back to me and continued as if she were not present, although she remained long enough to straighten the sheets on his cot. On the last day of this phase I was

about to leave, when he said: "Don't go yet." I remained seated, and he lay on the floor at my feet and slowly turned his back toward me until barely touching my trousers. He remained still for a brief period, then leaped up with a final yell and threatening charge. Next, he walked quietly to the window, looked out, paused, and said in a soft, low voice, "The experiment worked." I dutifully and promptly denied experimenting, to which he replied: "*I* did." The next day he was well dressed, quiet and pleasant, out of seclusion on the ward. Treatment was interrupted shortly after, when his family insisted he go to a hospital nearer where they lived.

This patient, as is frequent in schizophrenic patients, had a serious problem in maintaining any reliably durable human relationships. He oscillated between a wandering loneliness, tolerated by living in a stereotyped form at home, and some artistic success, which was more promising when he was younger. He also experienced distantly fantasied, infatuational hero-worship, on the basis of assumed similar aesthetic goals and striving by the hero—a "working-shoulder-to-shoulder" concept, with mutual commitment to the goal. My references to freedom for direct expression of desires put the responsibility on him for decisions, controls and results—at a time when he was least able to handle such problems, and when he most needed the situation to be structured. His experiment—to solve this problem—was to determine whether the environment, chiefly his physician, was fully permissive and completely under his control, or whether I would reject an offer of immediate physical intimacy (fighting or sexual) and so make a more reliable, long-term relationship possible. The patient's use of the so-called homosexual communication appeared thus to be in large part a symbolic expression of concern with the temporal reliability of social communication which he could tolerate. The moderate panic—which was highly stereotyped in its succession of gestures—may well thus have been an organization of transactional behavior, as it were, to prevent or to defend against "being possessed" or "being taken over by" destructive or sexual *activity under its own control* and hence, neither "personal" nor "human." Such bare *activity*, completely independent of human responses and almost independent of other environmental responses, represents personal dissolution; i. e., it represents the extreme "anxiety" and "panic" of Sullivan and the "catastrophic reaction" of Goldstein.

Work with several other patients who were entering or verging on panic states has indicated that possibly relatively few acute *activity* patterns are seen in these states. Depending on current, culturally preferred values, one or another may be commoner. The patterns which, during incipient panic states, appear to have been selectively influenced by specific modification of the therapist's verbal behavior or by other specific environmental contingencies seem chiefly to center around destruction, sex, flight, and dependency—the last virtually of the prelocomotor, infantile type. Thus, one patient continued to become more disturbed and increasingly obscurely communicative through several maneuvers directed toward relieving concern with destruction and sex. These, for example, included having an attendant in the room with me during the interview. Finally, I said—slowly and a touch bored—"Of course, if you *should* run away, we would come after you and bring you back." The patient hesitated a second or two in his movements, and from that time the disturbance subsided. Another patient was building up increasing demands for liberty and freedom with increasingly threatening gestures. References to a variety of possible directions of *action* he might be concerned with were disregarded. Finally, in response to a more extreme demand for "freedom to go home and where [he] wanted," with unmistakable discrepancy between the verbal content and the mode of the demand, I answered: "You want to be taken care of." He became belligerent; so I continued as though completing the sentence: "You are not *so* different from other people." This proposition was the center of discussion for some four sessions, after which steady improve-

ment took place, leading to living out of a hospital—he had been in several—for the first time in eight years.

There are no doubt other behavioral patterns which patients in incipient panic states "perceive" as threatening to "take over." The four mentioned are the only ones on which I have even the sketchy, preliminary sort of data noted or which I have heard discussed by colleagues. Conventional concepts, such as death, murder, rape, homosexuality, guilt, jealousy, and losing one's mind, are too complex for seriously disturbed persons to deal with. Thus, death is quite tolerable where the process by which it occurs is an accepted cultural role. The future, permanent excommunication does not exist except in a complex conceptual system, requiring considerable temporal-spatial differentiation. For the disturbed person, whether the disturbance is precipitated by environmental factors (as in combat) or by functional or organic intracerebral processes (as in psychosis or brain injury), the threat felt appears to be excommunication *now*, at the *moment* of the course of consciousness.

To return to the incident of the young art student, outlined earlier, I should like to call attention to the sharp and complete shift the patient made when he turned and interacted with the nurse and when he turned back to me. Quite consistently, psychotic patients will deal with a situation including other people as a whole, or, if they enter into an interaction with one person in the group, that interaction proceeds much as it would if no one else were present.

Thus, a moderately deteriorated, hebephrenic young woman, who was more or less mute and remained isolated on the ward, went to tea at a neighboring inn with two other persons. She poured tea, made a number of comments appropriate to afternoon tea, and would have been judged by an onlooker as a somewhat shy, naïve girl, in her latter teens (early 20th-century edition). There was no indication of personal involvement—in the sense of a reciprocal transaction—with either of the other two, although she was well acquainted with them. When "tea" was over, she became mute and passively accompanied the others back to the hospital. When she arrived on the ward, her favorite nurse stepped forward to take her hat and coat. The patient made no attempt to remove them, but entered into an intense interchange with the nurse, of mostly psychotic form on the patient's part. From previous experience the nurse recognized the major significance of the message, took the patient's arm gently, but firmly, and walked with her to her room. The patient sat alone, looking preoccupied, for 10 to 15 minutes, then came to the door of her room. The nurse immediately went to her, received her hat and coat, and the patient went back into her room and lay down.

This limitation in dealing with more than one other person, which accompanies disturbance, is very striking and often may provide a useful guide for estimating improvement.

Thus, a patient, soon after starting in treatment, spent most of his interview time in complaints. He did not differentiate among administrators, superintendent, former physicians, and myself in his characterization of physicians, and around the hospital he tended to avoid contact with them. One day, after about a month, he was more vigorous in his accusations, talking loudly and pounding the arm of the chair. However, he named and very precisely and differentially criticized the superintendent, the administrator, the physician who had referred him to the hospital, and myself. The criticisms related to acts which were quite conventional, but which were discrepant with the patient's needs, or more or less pinpointed personal characteristics to which he was sensitive. Thus, I was "an arrogant school boy," who "rushed in where angels fear to tread." A little thought made it clear that in certain aspects of our transactions this characterization was accurate. The only deficiency in his "perception" as communicated was its limitation to the very narrow verbally differentiated part of only some aspects of our transactions. Hence, I agreed, and, in order to temper this attack on the defenses of his uncertain self-esteem (that his doctor was a "school boy" and a "fool"), I inquired as to what else he saw in me. He returned to his general criticisms, and so, toward the end of the interview, I expressed favorable interest in his separate characterization of the four physicians he had previously lumped together in a single general definition. Before this episode he had tended to use the third, rather than the first and second, personal pronouns, but now used the latter increasingly. He had also previously described events in terms of dealing with situations; later he identified people in the situations and their interactions with himself. Still later he described interactions between other people and the effects on himself. Another patient, during

the first month in therapy, never mentioned his brother, who was also his business partner and was largely supporting him. Then the brother was mentioned, but for several weeks only as a fixed definition, "a millstone round my neck." The next stage was shorter, and in it the brother was one or another of three definitions, namely, "a millstone round my neck," "someone who will take care of me," and "someone I can work shoulder to shoulder with." The shifts from one of these to another occurred with changes in the characteristics and mood of his transactions with me. Following this, the patient began tentatively discussing the possibility of the brother talking with me.

Another aspect of the integrated character of "perception," "communication," and "transaction" is seen in certain schizophrenic patients during rather disturbed periods. This consists of reversals, discrepancies, and changes in statements concerning people, things, and events from one time to another. The observer finds such kaleidoscopic variations highly puzzling or may dismiss them as confabulation or confusion. Thus, a patient spoke of a Miss B. (a nurse) as "a good friend" in a vague description of a recent episode. About five minutes later in the interview, when speaking of another —as I thought—related episode, the patient denied ever having known Miss B., when I inquired about her possible participation. Later, on the ward, the patient spoke to Miss B. in her usual manner of speaking with the nurses. I failed to find out the explanation of the discrepancy, but, on the basis of other, more or less similar experiences, have assumed that "Miss B. as a good friend" was equivalent with "I felt friendly." In the second episode, in which the patient was apprehensive, therefore, Miss B. did not exist. Dealing with Miss B. on the ward was again a distinct transaction. This phenomenon of dealing with time in a series of discrete, usually stereotyped transactional patterns, without overtly signaled transitions, is characteristic of certain forms of severe disturbance. It is probably one of the chief bases for the concept of the "split mind." As the capacity of the patient for dealing with longer time sequences increases, little may be recoverable of these patterns or their significance. The apparent perceptions verbalized in the disturbed state appear to be verbal concomitants of symbolic behavior, which with improvement no longer exist. The inability to deal with temporal structure of more than a few minutes' duration imposes great uncertainty. As soon as hours can be conceptually divided into minutes, days into hours, and weeks into days, much of this uncertainty disappears, and with it the symbolic form limited to the short, discrete transactions. The whole period over which time was structured in periods of minutes separated by uncertainty is then usually condensed into a word or phrase, "when I was sick," "that time," "like a dream."

A very practical problem involving a patient's capacity for temporal structure and perception of behavior and for symbolization of personal status is that arising when the responsible physician leaves for a few days to attend a meeting, to visit elsewhere, or whatever. Fromm-Reichmann [22] described an instance in which the patient formulated the question in a condensed form. Dr. Fromm-Reichmann had just told the patient she would not see him the next few regular sessions and continued, "because I am going away for a week, but I will see you when I come back." The patient fell silent, looked past her at the wall of the office, and, after a short interval, said slowly, in a low voice, with little or no inflection: "A week—five minutes—a hundred years." Dr. Fromm-Reichmann sensed the problem immediately and answered: "I will see you at 11 o'clock in the morning on Monday, the 17th of October." The patient gave her a quick glance and left the office with his usual, stereotyped rituals. This was the first indication this patient had given that he could use words for structuring time, though the verbal symbols still had to be sharp and concrete. Words implying continuity of time apparently evoked "feelings" which were as subject to current information as they were to previously received information. In other words, if one cannot differentiate a week into a sequence of

probable events, then during the designated period memory of the words—"a week"—evokes a highly condensed, undifferentiated pattern of anticipatory orientation which includes current events, irrelevant to the objective or end-state to be arrived at. A precisely concrete symbol, in contrast, although it does not evoke orientation to continuity of time, provides a *precise closure* and so does not evoke as many irrelevant, undifferentiated "feelings." Common usage of verbal symbolic behavior referring to temporal contingencies shows equivalent characteristics, though in a mode of behavioral complexity of a different order of magnitude. Hence, at first glance, the common usage appears qualitatively different from the psychotic.

The problem of the probability of reliable continuity of social communication is so great and the threat of social isolation so severe that in average normal, "neurotic," symbolic behavior it is denied by being occluded in symbols or symptoms which could exist only under conditions where this probability is essentially a certainty. A nice illustration is the commonplace saying: "He likes himself so much he wants to be the bride at the wedding and the corpse at the funeral." The acuteness of the problem may be emphasized by the very complex set of phenomena referred to by the word "pain." An extraordinary variety of inputs to the central nervous system, which are all unusual, and most of which are initiated by tissue-destructive or organ-malfunctioning contingencies, give rise to a wide variety of behavior patterns, a number of which the observer classifies as the "feeling of pain" by the subject. In virtually all concepts of pain in our culture the implications of danger and the urge to avoid, correct, or mitigate the cause of the results are dominant. In disturbed cerebral functioning these dominant cultural attitudes are present, but interpreted according to the patient's view of the current situational context.

For example, a patient whose treatment I was discussing at intervals with a colleague came to the hospital in a subacute, moderately disturbed paranoid state. He had spoken two or three times during his first six weeks in the hospital of an appendectomy, performed when he was around 5 years old. The medical care at the time in the town where he lived was apparently poor. His mother stayed at the hospital most of the day and night, frequently shushing his complaints but for the most part sitting silent in the corridor. His recovery seems to have been delayed by a subcutaneous infection at the wound site, which was drained. Shortly after his return home the mother was taken to the state mental hospital with a diagnosis, he heard years later, of schizophrenia. The patient became an effective and quite wealthy lawyer, but suffered a psychotic break in his late 30's, treated initially by electroconvulsive shock. During the first six weeks of psychotherapy he had once or twice used the expression "full of pus" in referring to himself, the expression being mixed in with a variety of complaints about himself and criticisms of the hospital. He had also spoken in a similar way, and not in an understandable context, of "mother in me." ("Mother in me," "getting rid of mother out of me," various references to "the Virgin Mary" and "the Mother of God," as well as other related expressions, are symbolic forms frequently heard in the verbalizations of male paranoid patients. In general, they appear to refer to the horror of illness in a variety of situational contexts, with emphasis on its duration and the consequently increasing hopelessness of the "only hope.") One day the patient came to the office complaining bitterly, his eyes moist, gesturing toward his abdomen, and repeating "Full of pus, full of pus—and you doctors do not do anything about it! Why don't you do something? Full of pus—and you call yourself 'a doctor.' This is not a hospital," and so on. After a little time there was a pause. My colleague got the patient's attention by turning sharply toward him and looking straight at his eyes. Then he said, slowly and distinctly: "Babies grow in mothers—mothers do *not* grow in babies." The patient looked away at the wall, sat silent some 15 seconds, turned, and said: "yes, that's so, isn't it?" He then continued discussing, in a relatively relaxed manner, certain current events he had been discussing in preceding sessions. For the remainder of his treatment in the hospital, about eight months, pus and infection in the abdomen were never once mentioned. The day after this episode, however, he spoke to the nurse on the ward about having cramps in his belly—a symptom which is very frequent with schizophrenic patients during certain phases.

This incident, with others resembling it, suggests that one of the ways in which a schizophrenic patient may express bodily sensations, including pain, is in the ex-

periential mode of symbolic behavior, in which the sensation, the life problem, and the social context are condensed. In the instance cited, pain, a hopeless condition, and anticipation of rejection appear to be condensed in the words "full of pus," expressed in a bitterly complaining tone of voice. The added statement: "You doctors don't do anything about it" clearly indicates that the patient has improved to the point that he at least suspects that he *could* trust somebody and is ready to listen. No such direct, personal questioning had accompanied his previous statements about his condition.

My colleague's response concerning mothers and babies had been derived from a discussion with another therapist on the general significance of the condensed symbol of "something 'in me.' " In the most general terms it appears to ask the question: "Can I sufficiently fulfill, so as to be accepted as human, the cultural roles my body implies I should fulfill?" In other words, it seems to refer to discrepancies between anatomical implications, extreme forms of cultural roles, and recent or repeated failures in human relations.

The use of a condensed symbolic response to a disturbed patient may have very dramatic results. I have found, however, that it should be obviously tagged for later clarification. There is a danger otherwise in the patient's *assuming* certain attitudes, intentions or whatnot on the part of the therapist which were quite different from his *intended* implications. Such misunderstanding can be rather dangerous, at best resulting in waste of time.

The incidents reviewed here have been selected in order to illustrate the courses which personal transactions may take when the data are processed in experiential modes of symbolic behavior, and also possible "translations" or "interpretations" of the transactions in a more differentiated form of symbolic behavior when the "observer" is communicating with his colleagues. For the present, it would appear (from the research point of view) that the concepts—or operational models—of "reciprocally evoked transactions" and of "data processing" may be of considerable value in the study of behavior, including perception and its communication. Indeed, it seems entirely likely that with more adequate operational definitions of biological concepts it will prove possible to apply directly to psychiatric problems the more precise principles of data processing and its limitations in the human which have been studied in the laboratory by Miller,[24] Bruner, Goodnow, and Austen[25]; Goodnow,[26] and others. The importance of such research for the analysis of the social factors in mental illness and in psychiatric treatment, which have been so brilliantly demonstrated by Hollingshead and Redlich,[27] can hardly be overemphasized.

The student of human behavior is faced with the problem of having to deal, first, with the subject in a reciprocally evoked transaction and, second, with his colleagues in a similar transaction. Transactions with the colleagues are generally conducted by the use of verbal symbolic behavior utilizing symbols which, in their hortatory function, are presumed to evoke equivalent or complementary behavior in the vis-à-vis. Excepting the reaffirmation of group cohesiveness by the use of group-accepted forms (and the reverse), these are rarely immediately successful. In transactions with mentally ill persons the major problems are to determine the significance of the symbolic behavior in terms of the environmental contingencies which can be shown to modify it. On the basis of the studies of Weinstein and Artiss and their associates, it may be concluded that the following given factors (determinable or modifiable by the investigator) should be taken into account: (*a*) the degree of impairment of cerebral function, due to "anxiety," or "injury," or combination of both; (*b*) the message conveyed by the observer; (*c*) the preferred system of communication (derived from informal, cultural role values) learned in early life, and (*d*) the significance of the patient's life situation in its current social context, e. g., the

threat of social isolation from the current, preferred reference group.

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# Maintenance of Stereotyped Roles in the Families of Schizophrenics

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Schizophrenia has been considered, by those concerned with environmental factors, to have etiological roots in various aspects of environmental pathology, including symbiotic mother-child relationship, trauma, and empathically communicated anxiety. Although this approach has been fruitful, it has seemed to us to emphasize selectively one or another single factor; we have felt that it would be helpful to begin to develop a larger frame of reference which would make possible the inclusion of the environment as a whole in our formulations. The family, comprising almost all of the child's environment, seems to be a natural object of study in an attempt to arrive at formulations based not on any one relationship or event but on dynamic elements which permeate all relationships and events in the child's life.

Our approach, then, is based on the view of the family as an integrated unit, a social subsystem, the character of whose operations can be greatly illuminated but not defined only in terms of knowledge of the separate, individual family members. The reciprocal expectations of the family members, translated into role behavior, become organized into a conception of the family shared by the family members. This familial conception may become experienced as a force in its own right by the family members, and, in effect, may reflexly act upon the individuals to reaffirm and fix their roles. In this sense, there may develop a family identity which generates self-perpetuating forces, and in pathological cases seriously constrict, or even entirely displace, individual identity.

This paper is a product of an on-going, long-term study begun at the National Institute of Mental Health in 1954 on the nature of family relationships in mental illness. During the first phase of this program, the research plan called for intensive study of family units, with the hospitalized schizophrenic patient seen in intensive psychotherapy and the parents seen twice weekly on an outpatient basis. Data from other family members, friends, nursing staff, and ward administrator were included in the reconstruction of the family patterns. The prime object of this phase of the research was preliminary delineation of qualities and patterns of relationships in the families of schizophrenics, and the formulation of hypotheses regarding their effect on ego development and identity. A general statement of our hypotheses has been previously published.[3] The present paper will focus more especially upon the quality of schizophrenic family role organization and role behavior in relation to the development of a sense of personal identity. Some of the relevant issues will be illustrated by clinical material from a particular family.

Our clinical observations of the families of schizophrenics have led us to hypothesize that a family pattern of seemingly significant occurrence includes the following main elements:

1. Family roles are grossly condensed and stereotyped; complex expectations and experience are reduced to a series of simplified formulas.

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2. There is a rigid organization to the family's conception of itself, from which no deviation is permitted, even though in some families exchange of roles is possible.

3. Each family member collaborates in enforcing adherence to the roles defined by the shared conception of the family.

4. Any attempt to modify or amplify these rigidly defined roles has to contend with the powerful, repressive forces against drives, such as aggression, in the family members.

These factors lead to the establishment of a family legend or myth, in the maintenance of which each family member makes an anxious investment. In ways we shall specify, the investment in the maintenance of a family concept of itself, a family myth, can seriously interfere with the individual's identity, and lead in adolescence to an "identity crisis," to use Erikson's term,[2] of psychotic proportions.

The crucial area, in which the success or failure of the attempted achievement of identity lies, is the relation of the individual to the role. The taking of a variety of roles is a form of experimental learning of what can or cannot be done, of what does or does not fit with the expectations of others. Roles provide the individual with techniques of getting along, of a continuing consciousness of himself in relation to others, of the position he occupies in the social situation; but, somewhat paradoxically, the ultimate value of these achievements depends on a movement which carries the individual beyond role learning. This movement is the separation of the individual from his roles, the capacity to gain a critical distance —the separation of the observing ego from roles—which makes possible the selection, rejection, and modification of roles, and their integration into a unique identity. This selective, critical integration of roles involves the qualities of flexibility, resourcefulness, and imagination, which make possible the adaptation along original lines of what has been learned to the new situation. Its opposite, the mechanical capacity to take certain roles, is most apparent in the as-if quality of schizophrenics who have made a social recovery.

The family, then, must provide a context which is larger than that established in the learning of particular roles, a context where the individual can imaginatively and actually have a distinct identity and feel safe with this identity. This includes not the mere tolerance of not fitting into the expected roles completely and automatically but a positive valuation of such noncomplementarity as an evidence of individuation. Parents, as objects of identification, must also demonstrate the capacity to alter and rework their roles in original ways that suit them. The context under discussion permits the individual to consider all possibilities within himself, so that his resultant conformity to societal expectations becomes a matter of choice, and not as captive to his failure to imagine alternatives.

The point at issue is the distinction between roles and identity. Erikson, in discussing identifications in an analogous way, says: "Identity formation, finally, begins where the usefulness of identification ends. It arises from the selective repudiation and mutual assimilation of childhood identifications, and their absorption in a new configuration."[2] He goes on to point out that identifications, being made only with aspects of people, do not, when added together, result in a functioning personality. Similarly, the sum of roles does not yield a functioning personality. It is precisely this big jump, from roles and identifications, to identity, that the schizophrenic fails to make. The breakdown at adolescence, where childhood identifications and roles are no longer the only materials needed to live, is the stage at which inner drives and societal expectations require an original being who brings a unique self to relationships in work, sex, etc.

It should be added that there is an element of the future in the matter of identity; that is, identity brings with it a sense of what one is becoming, as well as what one is.

Martin Buber points out that it is possible to imagine another, that is understand his identity, only if it is possible to imagine what he is becoming.[1] This future-directed aspect of identity marks identity as a process, and not as a static achievement.* The fixed, "finished" quality of schizophrenics seems related to this failure of the forward-directed process in identity.

It is our impression that in his prepsychotic living the potential schizophrenic, because of his participation in intrafamily operations, can neither articulate his emerging personal identity with nor differentiate it from the roles available to him in the shared ideology of family life. In addition, new roles and role modification in the future do not seem possible within the framework of this familial ideology. The shared mechanisms or operations by which such a familial ideology is enforced and role modification is blocked have been described in a previous paper.[3] In any event, the result is a diffusion and confusion of experience and identity that can no longer be matched with the only varieties of role behavior that seem available.

It should be noted in passing, if it is not obvious, that both "native" individual characteristics and the family characteristics may contribute to such difficulty. When the family role structure and ideology is highly amorphous, vague, or inconsistent, and yet all-encompassing, it is relatively easy to see how such a setting for psychological development may contribute to identity diffusion. However, when the family roles are unusually distinct, the implications for identity development are less manifest. Therefore, we wish to exemplify such a family ideology and structure to note how stereotyped family roles may provide a setting for an identity crisis of the kind found in acute schizophrenic episodes.

In the F. family there was remarkably complete agreement about the character of each member and of the nature of his relationships with the rest of the family. The family consisted of two parents, in their 40's, and two daughters—Jean, who was 20, and Nancy, aged 17, the hospitalized one. Some quotations from interviews may convey the flavor of this striking unanimity.

Jean, describing herself and her sister, stated: "We're so entirely different. Nancy was always the quiet one, and I was always the heller, always in trouble.... I was a great chore to my family. ... I'm a lot like my father. I have a very quick temper. I was always my father's favorite, and he never really paid much attention to Nancy.... Nancy was always the one who had the good marks. I never had good marks in school. I was always very boy-crazy. I used to do horrid things. I used to sneak out about 12 or 1 o'clock at night and open the garage door and just take the car and be out until 3 o'clock in the morning. I don't think anything like that would ever dawn on Nancy.... Nancy was always a good girl. She really was. Nobody ever had any trouble with her. She never told a lie. I was getting to be a pathological liar. Every word that came out of my mouth was a lie."

The father, in speaking of this elder daughter, said: "She was the one who gave us the trouble. She had a disposition much like mine. Volatile... Jean was a very determined person. I would spank her with feeling. Never so with Nancy. Nancy's conduct was always beyond reproach. At least she was smart enough to know when to stop or cover up.... She was so well poised, so apparently placid, although very determined."

The mother said: "Jean was always difficult. You could talk Nancy into anything. Jean and her father are alike. They blow their tops. Nancy and I keep things quiet. Jean and her father were at one another's throats in two seconds. They understand each other. Jean defies him. Nancy never got into conflict with him and never required a reprimand."

Nancy, the one who got hospitalized, said: "Daddy and Jean are alike in their tempers, and mother and I. Mother and I have greater poise, and we say what we mean. Daddy and Jean have identical personalities. When they get angry, they say things that make no sense. They have no poise."

Both these girls struggled to gain a clearer view of their behavior, which troubled them,

* Erikson,[2] p. 71, states: "From a genetic point of view, then, the process of identity formation emerges as an evolving configuration—a configuration which is gradually established by successive ego syntheses and resyntheses, throughout childhood; it is a configuration gradually integrating constitutional givens, idiosyncratic libidinal needs, favored capacities, significant identifications, effective defenses, successful sublimations, and consistent roles."

but sources of which were out of their awareness and beyond their capacity to evaluate. Jean's rebellious adolescent behavior was extreme, to the point of endangering her future. She was frightened, felt she did not know what drove her on, and was relieved when her family happened to move to another city, thus removing her from the disturbing situation. She had been going with a boy who on occasion beat her and threatened her with a gun. She said: "I was getting more mixed up, was getting to be a pathological liar. I hope my children never have to go through that." This behavior reached its height near the end of high school, when she, without premeditation, decided to go to nursing school; this decision meant a separation from her family. She did surprisingly well, and rather quickly stopped the delinquent behavior. Toward the end of her nursing training, she met, and subsequently married, a quiet, serious young man who runs a hardware store. She has since become a settled young housewife and mother, with no outward sign of the previous behavior. She regards it as a serious crisis through which she safely passed, saying, with relief: "I survived," thus indicating the vital nature of this struggle to alter her legendary role in her family.

Nancy, at 17, had a psychotic episode whose onset was characterized by difficulty in concentrating, feeling lost, not knowing what to do. She was completing her last year of high school, at a boarding school. By this time Jean was getting ready to graduate from nursing school, was engaged, and had completely stopped the behavior that had so worried the mother particularly. The onset occurred when mother was away to visit Jean for several weeks. Here is her description, a year later, of her complete diffusion of identity during this psychotic crisis, and of her agonizing attempts to find new roles out of which her identity might be reintegrated.

"When it all began, it was like, well, it was like losing everything and beginning all over, starting right from scratch, trying everything out. I felt that everything I had ever done was wrong. So then I tried to throw out everything I ever felt or did before to do the exact opposite. That didn't work, and just constantly pushing things away and starting again. And when I'd get on the wrong track and it wouldn't work, I'd feel worse than not trying at all, and try something else.

"After the affair was mainly when I felt the very worst. I didn't want to see another boy, to be with people, to go to another party. I wouldn't wear lipstick; I wouldn't wash my hair; I didn't care how I looked, which was unlike me.

"That went along for awhile. It didn't work. I still felt terrible; so I threw all that away and then I threw all my studies away, put my lipstick back on, washed my hair again, started smoking again and went overboard; went to more parties, was too gay, and too familiar with people.

"Then that fell through, that wasn't what I wanted, either. Then I went into a slump. I didn't know what I wanted; I didn't know what to do; I didn't know where to start, and it got so that even getting up in the morning and getting dressed was a very big problem. I'd just do what anyone would tell me, just do what anyone said; I didn't trust my own judgment. I felt that if I did what everyone told me I would be all right, that that was my answer.

"Then I was going to be defiant and stand on my own two feet and knock everyone away. I was going to do it all by myself. So then I was outspoken, demanding. Then that didn't work either.

"I'd go from one extreme to another, back and forth. Then I thought that all that was worth living for was to sit down and eat a meal. Then all that was worth living for was to work, just working myself to death. Then all that was worth doing was being nice and sweet and having nothing in mind, being very indifferent toward everything; all that was important was that I got out of the hospital and went along with everything, and was a good girl and was nice to people and helped around the house."

Nancy became increasingly frightened and confused during these weeks. She reported some of this to her father, including her concern about her sexual experimentation, and her father minimized this as nothing to worry about. She had some manic periods, and finally became extremely excited, delusional, and assaultive. On being hospitalized, she continued to be violently hostile, especially toward her parents, and ran away from one hospital. Her family felt she was not the same person at all.

The amazement of the family at the breakdown of the accepted role arrangements in the family was evident in the reactions of the parents, Jean, other relatives, and Nancy herself.

Jean says: "I can remember when Nancy was in the first hospital, and she lost her temper about something, and she was saying, 'Why do I have to stay here?' and my mother said: 'Now Nancy, stop hollering. You don't have to holler.' And I remember she turned around to me and said; 'I don't belong here. Jean and Daddy belong here. They're the ones that do all the hollering.' She said: 'If anybody hollers, if that's what you're here for, hollering, then Jean and Daddy belong here.' And I can remember thinking, 'Oh Lord! How right she is!,' because my father and I used to have the worst battles."

She points out, in effect, that Daddy and Jean, behaving this way all the time, are regarded as normal, while she gets put into the hospital because she has changed from her usual behavior. It is the *change* in roles which has led to her being treated as sick. The universal response was one of disbelief, accompanied by a remark along the lines of "Oh no! not Nancy! I could understand this happening to Jean, but not to Nancy!" This was, of course, as much an expression of their disbelief of Jean's conformity as it was of Nancy's rebellion, and this incredulity is a measure of the rigidity in the view commonly held about the girls.

Both the content of the roles ascribed to various individuals and their rigid, stereotyped form are psychodynamically determined. Let us examine some of the data regarding the parents which throw some light on at least the major determinants of the role pattern in the family. The mother had been rebellious toward her parents until early adolescence, at which time she changed radically and developed a guilty anxiety about the effect on the parents of defiance from her or her siblings. Earlier she can recall being beaten by father and thinking: "No one is going to make me do what I don't want to—I will not give in, no matter how he beats me." She never cried when beaten. Her siblings were extremely rebellious; her brother was jailed for smashing up cars and driving recklessly, and was expelled from several schools. Her sister consistently lied to the parents, climaxing this by concealing from her parents that she was failing in high school, and leading them to believe, by altering records and destroying letters sent by the school, that she was going to graduate. Not until graduation night, with the family seated in the auditorium, did she reveal the situation.

After her own reformation, Mrs. F. (the mother of our patient, Nancy) observed her brothers' and sisters' behavior with amazement and envy. Her frequent thought was: "How do they get away with it?" She became increasingly "satisfied" with what she had, and very proud of this capacity to be satisfied, so that when she and her sisters bought similar items of clothing, she would be contented but they would seem be dissatisfied and wish they had gotten something else. She feels that her sisters, and now her husband, envy her this capacity to be satisfied. Along with this she developed the ability to "play it safe" in her relationships, by maintaining a distance, by "not getting too involved" with others. She feels generally that she can elevate herself above what is happening around her and keep herself apart from it.

Mr. F. had been an undisciplined, overindulged youngster, never having to account to an authority, whose resulting anxiety took the form of uncertainty, feeling vaguely dissatisfied with what he was doing, and wanting to change careers frequently. His defenses have taken the form of being intensely "practical," getting things done, and ruling out subjective considerations. In the familial conception, he is notorious for his impatience, irritability, and temper outbursts, although it is striking that his work calls for a high degree of diplomacy and tact.

In both parents, then, we find sources for the roles subsequently assumed by the children. The mother's hostility and rebelliousness is repressed but is unconsciously valued; the father's inability to conform to authority and his infantile omnipotence have been similarly repressed, but with inconsistency and frequent breakthroughs. Jean became the

representative of these drives toward rebellion and toward infantile indulgence of whims regardless of consequences. Nancy's role seemed fashioned out of what the parents more consciously valued—quiet conformity, being satisfied, compliance. There is much striking evidence of the parents' reenforcement of these roles by their failure to become aware of the destructive connotations in the restricted development of their daughters. Father, for example, never felt that Jean's behavior was a matter of serious concern, and felt she would be all right if left alone. He saw no need for concern about her escapades, although the girl herself was badly frightened. Mother made continual, but ineffectual efforts to stop the delinquent behavior. Neither parent had any concern about Nancy's extreme compliance and docility, although she did poorly in the first few grades in school, was left back twice, and was daydreaming a great deal, according to teachers.

An inevitable corollary to the rigid maintenance of stereotyped roles is the violence that must accompany any change. In this instance a psychotic episode, a period of turmoil and crisis, and, it should be added, periods of depression in the parents accompanied the change within the family and the achievement of a few equilibrium. It is our feeling that the upheaval within the family is not in itself therapeutic, since it may lead to an exchange of roles but not necessarily a greater integration of those roles within the individual. In this family, for example, Jean has successfully shifted from the role of self-destructive rebellion, and is now married, "settled down," and outwardly easygoing and jovial. She is still anxious, has occasional marked outbursts of temper at her children, and suffers from persistent hypertension. She identified herself with a maternal aunt who was also rebellious when younger and who died of hypertension recently. Nancy, too, seemingly made a good recovery from the psychotic episode, and is now happily married, but has tended to overemphasize her new-found assertiveness which appeared to contain in it a denial of anxiety. In other families, the new equilibrium has been attended by a greater distance among the family members, and a less intense involvement with each other.

## Summary

In presenting an approach to the family as a unit, we have attempted to describe schizophrenic family dynamics in terms of role patterns and to formulate some implications for identity development. In the clinical material cited, we have described one particular role pattern, in which rigid, oversimplified, and stereotyped roles constricted identity development and contributed to serious crises, including psychosis. We have further tried to trace some of the dynamic, unconscious determinants of those roles.

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# Direct Instigation of Behavioral Changes in Psychotherapy

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## Introduction

In recent years a number of articles [1,2] have challenged claims that any particular type of psychotherapy offers patients with psychoneuroses a better chance for recovery than other therapies or even none at all. In studies comparing treated and untreated groups of patients or groups treated by different techniques, the groups compared often do not match as satisfactorily as we could wish.[3] Nevertheless, we know that many patients with psychoneuroses recover from these illnesses either entirely without treatment [4,5] or with very little psychotherapy.[6,7] This raises the question of whether the processes of recovery are the same in patients receiving psychotherapy and in those not receiving it. And when a patient does receive psychotherapy, can he benefit as much from his experiences with other persons as he does from his experiences with his therapist?

Some years ago I began to notice that patients often improved markedly when they mastered some stressful relationship. As this sometimes occurred very soon after they had begun therapy, I could not credit myself with having contributed much to their success. In a study of the vocational rehabilitation of psychiatric patients,[8] I also observed that a return to work (after a very little psychotherapy) was followed by a marked improvement in psychological symptoms. From these observations I have inferred that the process of recovery from psychoneuroses outside therapy probably does not differ significantly, if at all, from that in patients receiving therapy. We have now considerable evidence that psychoneurotic behavior is learned maladaptive behavior and that consequently recovery requires unlearning and new learning of behavior. If this is so, it makes sense to think that psychoneurotic behavior can be unlearned as readily with other persons as with a psychotherapist, provided certain conditions are met.

Three reasons may make other persons even more suitable than the therapist for the patient's learning new behavior. First, under the best of circumstances (usually available only to the prosperous), the psychotherapist can spend only a few hours a week with each patient. The patient nearly always has much more opportunity for contact with other persons. In this connection, Imber et al.[9] have adduced evidence that patients improve more when they experience greater contact with their therapists. The more time the patient spends with his therapist, the more rapidly he tends to recover. Second, as the therapist becomes the patient's ally, and sometimes his only one, it may be difficult for the patient to engage intensively and combatively with the therapist for fear of losing his valuable assistance. Third, despite his great importance to the patient at the time of therapy, the therapist has little importance in the patient's life as compared with the significant persons in his natural environment. Mastery by the patient of his relationship with, say, his wife can obviously bring the patient more

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gratification than achievement of a satisfactory relationship with his physician.

Accordingly, perhaps the therapist can best spend his small amount of time with the patient not in studying and improving the patient's relationship with him but in preparing the patient for improved behavioral responses with others. Herzberg [10] became convinced of this many years ago and assigned his patients tasks which they were expected to accomplish away from the therapist. Cameron [11] and Wolpe [12,13] have described somewhat similar techniques and theoretical support for them. Among psychoanalysts, Rado and his colleagues [14,15] have departed from traditional preoccupations with the analyst-patient relationship and come to regard the therapeutic sessions as mere preliminary practice for the patient's necessary victories with other people. The foregoing observations and reports prompted a study of the effectiveness of the direct instigation of new behavioral responses on the part of the patient toward other persons in his environment.

## Method

*Patients.*—The patients are part of the group of patients with psychoneuroses coming to me for psychotherapy over a period of seven years. I have excluded those whom I treated during the same period with psychoanalysis or psychoanalytic therapy. These were selected chiefly on the basis of the patient's ability to pay for more frequent interviews. I have also excluded patients who discontinued treatment after less than 25 interviews and patients whose treatment could not be completed because they or I moved away. I am presenting the results obtained in treating the remaining 21 patients.

I think it important to emphasize that the patients all had symptoms of psychoneuroses extending back several or many years. Although often driven toward therapy by acute anxiety, they actually had long-standing characterological disorders.

*Techniques.*—I do not wish to suggest that the techniques I used with these patients excluded altogether those of more conventional forms of psychotherapy. In initial interviews, the patient told the story of his symptoms and of his life in the usual way. In later interviews, the patient did most of the talking and experienced the benefits of abreaction. He additionally received the benefits of an interested audience, with all the suggestion and reassurance this can carry.

However, important differences occurred in the focus of the interviews, which were turned toward the present rather than the past, and (for the most part) toward other persons rather than toward the therapist-patient relationship.

One can easily focus attention on the present simply by showing interest in it, just as one can easily divert the patient toward the past or have him talk exclusively about dreams. As in other psychotherapies, after a few interviews the patient knew what was expected of him and usually talked "spontaneously" about events since the preceding interview. He could, if he chose, talk about events of the past and often did so; but if he omitted mention of the present, I would usually insert an inquiry about periods of anxiety or other unpleasant emotions since the previous interview.

Having used my influence to focus the interviews in the directions mentioned, I then attempted to instigate in the patient new behavioral responses to current stressful persons and situations. I attempted to instigate chiefly three kinds of new behavioral responses. These may be called communicative, assertive, and affiliative responses. The patient was encouraged to substitute immediate, direct, and verbal communications with other people for delayed, indirect, and nonverbal communications. He was encouraged to assert his legitimate needs and express at the moment of arising his important emotions. When his social contacts were insufficient, he was encouraged to increase them, partly for the greater gratification he could obtain and partly to increase his interaction with other people.

I tried to avoid instigating behavior for which the patient was clearly unprepared and, instead, tried to guide him toward the mastery of a series of experiences of increasing difficulty for him.

Occasionally I assigned "tasks" to the patients after the technique of Herzberg.[10] But, in general, I found more satisfactory the use of indirect techniques to stimulate new behavior. Thus, although I was directly instigating new behavior, I did this for the most part covertly. I think one thus avoids increasing the patient's dependency on the therapist, which can happen if he receives direct instructions about what to do. The therapist also avoids his legitimate anger if things go wrong after such specific instructions. Finally, when the patient receives direct instructions, he will try to change to please the therapist rather than in his own interest. Patients try to change to please the therapist in every psychotherapy. Later the patients may continue the same behavior because its gratifications for them have reinforced it, independently of the therapist. But I think it better if from the beginning we assist the patient to change for his sake, rather than to please us. In any case, direct instructions are not often needed, even if there were no objections to them. Most patients have some ideas, often very sound ones, of what they ought to do. They often need chiefly the support of the therapist in carrying out their ideas.

In covertly instigating new behavioral responses, I employed several techniques. First, I used explanations of connections between the patient's behavioral responses to other people and his emotions and symptoms. In his history and reports of current personal relationships, abundant examples occurred of relations between what the patient said or did and how he subsequently felt. He was reminded of these and asked to contrast them with other occasions before or after beginning therapy when different responses brought pleasanter feelings. As therapy progressed, increasing awareness of these connections reinforced the patient's interest in changing his responses.

Second, I raised questions with the patient about his failure to make different responses. Such a question as, "Why didn't you discuss this matter with your wife when she came home?" arouses in the mind of the patient the possibility that he ought to have done this. It also communicates the therapist's conviction that he could have done this. Often it seemed stimulating to the patient if I brought together one of his "assertive" responses with one of his "weak" ones. For example, I have asked patients such questions as, "You talked to your boss about your salary. Why couldn't you talk to him about the working hours?" or "You can complain to me about your children. Why can't you tell the same things to them?"

Third, when the patient seemed to have denied or driven under emotions which could be inferred or which reached expression later or indirectly, I would go over the pertinent events with him in an attempt to evoke the original emotions more strongly and to help the patient discover that he had inhibited more appropriate behavior. This could be helped by comments, such as, "Well, I think nearly everyone in your place would have felt angry," and by questions, such as, "What thoughts did you have when your father said you were lazy?"

Fourth, I spent considerable time working with the patient's ideas about himself, which collectively we can call the self-concept. Once inhibited behavior occurs, it tends to be reinforced by misperceptions the patient acquires about himself. The false generalizations he may then make about himself, e. g., "I am a failure, a coward, or an alcoholic," tend to inhibit further constructive action.

Finally, I tried to help the patient correct his misperceptions of other people. Withdrawing behavior reduces communication between the patient and other persons and consequently promotes misperceptions of them, usually as being more menacing or less friendly than they are. Moreover, anxious persons poorly discriminate past and present. They do not adequately distinguish persons somewhat resembling their parents or other conditioning persons from later persons. In

general, I found that patients corrected their misperceptions more rapidly by additional experiences with other people than by hearing my interpretations. Thus, after standing up to a tyrant at his work, a patient could say: "How did I ever let myself be intimidated by him?" But, prior to his own action, he thought he had to deal with the invincible giant his father had been or seemed.

I discussed with the patient his behavior toward me for the most part under two circumstances only. First, when such behavior glaringly demonstrated to me some important trait which the patient practiced to his own detriment with other people, I drew his attention to it. Second, whenever the patient's attitude toward me interfered with his progress in the interviews or outside them, I discussed this with him. This most commonly happened when, under misinformed expectations of psychotherapy (or at least this brand of it), the patient relaxed to await my discovery of "what the cause was." Such a patient was firmly reminded that his recovery depended upon how much he practiced outside therapeutic sessions whatever he learned in them. I also discussed and interpreted a patient's irrational anxiety toward me whenever this blocked his talking freely.

Most of the interviews were conducted with the patient and myself sitting opposite each other. A few patients lay on a couch. The number of interviews per patient ranged from 26 to 120. The mean number of interviews per patient of those judged "much improved" was 61. The interviews were conducted at a frequency of one to three times a week, with most occurring once a week. The treatments continued for periods ranging from six months to three years, but most lasted about a year.

## Results

In evaluating the results of psychotherapy with these patients, I have used only the two categories of "much improved" and "unimproved." The word "cure" does not seem appropriate, and the category of "slightly improved" is a particularly difficult one to use, since almost any patient can enter it. In using the category of "much improved," I have in general followed the suggestions of Parloff et al.[16] in considering change in "comfort" and "effectiveness" of the patients. For admission to this category, I have required that the patient be free of symptoms and generally functioning with maximal comfort and effectiveness. (One patient only who still experienced some symptoms I nevertheless placed in the group of "much improved," because her condition at discharge and follow-up contrasted most favorably with that before treatment began.) The patients showed a capacity to encounter stresses which had previously strained them without their former symptoms. A second requirement of being considered "much improved" was that the patient could still be judged so at follow-up. I was able to learn through correspondence, from friends or family, or in personal interviews about most of the patients in this series, including all but two of the "much-improved" group. The time elapsing between the conclusion of therapy and the follow-up inquiries or interviews ranged from eight months to seven years, with a median interval of about two years. In making follow-up inquiries, I found that two patients whom I had previously judged "much improved" had relapsed. One remained well for a year and then relapsed. The second had been well and better at a first follow-up, six years after treatment, but the following year relapsed. Both these patients were then considered "unimproved." The remaining patients originally in the "much improved" category about whom information could be obtained reported themselves as well as before, and nearly all of them said they had improved further since, stopping treatment. Altogether, then, I felt justified in considering 14 of the 21 patients to be "much improved" and the rest "unimproved."

## Report of Illustrative Cases

CASE 1.—A 35-year-old business man presented symptoms including severe anxiety; this was especially stimulated by changes in his physical condition, about which he had many hypochondriacal preoccupations. Although moderately aggressive in business, he was submissive in close personal relationships and was easily dominated by his wife. He had many obsessive ideas, and the prolongation of his symptoms for many years before and during previous treatment had brought despondency and the contemplation of suicide. He had once been ambitious to enter politics, but had abandoned this plan in order to lead the life of an invalid, to which he had assigned himself. He had undergone psychoanalysis for five years, with negligible improvement in his symptoms. The death of his second analyst led to his referral to me. As the patient had been extensively trained in the method of free association and believed that he ought to continue a search for repressed memories and impulses he had been told he was "holding back," it was difficult at first to turn his attention to his current relations with other people. Gradually, however, he began to study the pattern of his failure to be sufficiently assertive with those who mistreated him. He began to express his needs and his anger when his needs were frustrated more and more openly, at first with less threatening persons, and eventually with his wife. As this occurred, his symptoms of anxiety receded, and with them the wide variety of hypochondriacal complaints of which they were the physical basis. After 15 months (120 interviews), he was free of symptoms and discontinued treatment. At follow-up inquiries a little over a year later, he reported still further improvement. The improvement in his well-being had led to the successful expansion of his business and to his carrying out his wish to enter politics.

CASE 2.—A 29-year-old man applied for the treatment of symptoms of severe acute anxiety, which had been added several months earlier to those of chronic anxiety, which he had experienced for many years. His anxiety had become stimulated by its own physical accompaniments, with resulting severe hypochondriacal fears of heart disease, insanity, and syphilis. He was taking large amounts of sedatives, but even with their help had been able to function less and less effectively at work and had begun to excuse himself from work and take long periods away from it. His relations with his wife and child were filled with antagonisms. As he had become phobic to public places, such as restaurants, his social life had become greatly constricted. This patient had been carefully trained by a tyrannical mother in habits of deference to older, and even contemporary, people. The patient assured himself, so he believed, of the approval and affection of other people by trying to please them in every way. This naturally required the suppression of many of his own wishes and emotions. His system first failed, and his symptoms first occurred, when he returned after his education to begin business in the small town where he was born. Instead of greeting him with awe and enthusiasm, most of the townsfolk ignored the fact of his return. This was especially apparent to him when they did not take up the opportunity of greeting him warmly in restaurants, where they certainly saw him and could hardly avoid him. The anxiety provoked in these circumstances subsequently became stimulated by the mere mention of restaurants. Certain persons had acquired a capacity to make him anxious through their resemblance, first, to a business partner who had exploited the patient's submissiveness and, ultimately, to his mother. It was possible to arouse this intelligent patient's interest in the mechanisms of production of his symptoms. He became curious about the ways in which he had become irrationally sensitive to a wide variety of people and objects. He practiced desensitizing himself to these stimuli by exposing himself to them in thought and in speech. He also practiced more assertive responses toward those who had previously intimidated him, especially his partner and his mother. In a little over a year (59 interviews) his symptoms had almost entirely disappeared. He was then working well and full-time, had expanded his social life, and greatly increased his enjoyment of his family. At follow-up inquiries, nine months later, he reported still further improvement.

CASE 3.—A 42-year-old housewife was referred by her family physician for the treatment of severe symptoms of tension and depression. She had difficulty in sleeping and was taking large amounts of sedatives. Her relations with her husband had deteriorated badly, and, as she found anxiety provoked by many different people and circumstances, she had reduced her social activity markedly. The patient's mother, under a façade of unselfish devotion to others, practiced this behavior in order to win their approval. She had inculcated in her children a need to appear "good," even when this conflicted with underlying emotions or reasonable self-interest. In conformity with this policy, the patient practiced appeasement of her husband and for many years permitted him to dominate her. At the same time, she covertly obtained her wishes in many matters by deceiving him, e. g., by allying herself with their children behind his back, and by concealing the bills for unauthorized expenditures. This behavior greatly increased her anxiety by adding a constant fear of detection. The prolongation of her symptoms and the guilt she felt about her behavior added depres-

sion to her suffering. The patient lived in a distant town and came for rather infrequent interviews (72 in all) over a period of two and a half years. The interviews were chiefly used to prepare her for more direct and more assertive behavior with her husband, and ultimately with her mother. In an irregular, but gradually uphill, course, the patient transformed her relations with all the important people around her. She abandoned her former docility and became much more expressive and assertive of her own needs and emotions. This resulted in a greatly improved relationship with other people, especially her husband. Their sexual life, which had become almost entirely arrested, revived in a way which was astonishing to both. When therapy was discontinued, she was free of symptoms; her social life was entirely normal, and she had returned to a former interest in art, which she took up with zeal and success. Alone of all the "much improved" patients in this series, she had some anxiety on separating from me. Nevertheless, she accomplished this satisfactorily and continued to improve afterward, as she reported in a letter nine months later.

CASE 4.—A 22-year-old stenographer applied for the treatment of symptoms of chronic anxiety, which included dysfunctions of the bowel (e. g., abdominal pain and diarrhea), dysmenorrhea, and palpitations. She was diffident and timid with others and, although physically attractive, doubted that men could find her so. She was engaged to a man for whom she had little enthusiasm, but hesitated to break away from him. She lived at home in an essentially child-like relationship with her parents, toward whom she felt alternating, and sometimes simultaneous, attitudes of dependency and rebellion. In the patient's favor were high intelligence and a strong wish to achieve independence from her parents. She was treated for a year, with 40 interviews in all. During this period, her assertiveness with others greatly increased. She was able to separate from her fiancé and engage in improved relations with other men. At the end of the year of treatment she was ready to leave her parents to work in another city, and did so. By this time her anxiety had been greatly reduced and the bowel dysfunction and dysmenorrhea almost abolished. A follow-up inquiry six years later brought the information that she had sustained and consolidated her improvement. She was entirely free of symptoms and had, in the meantime, become happily married and the mother of a child.

## Comment

Insofar as one can compare results of psychotherapy in different series of patients, the results in this series compare favorably with those reported for psychoanalysis and also, one must acknowledge, with those reported for patients receiving little or no psychotherapy. Concerning the latter comparison, I have already mentioned the evidence that many patients recover from psychoneuroses spontaneously, that is, through their own experiences and exertions. Many of those who do not so recover may then find their way to psychotherapists. If so, then the two groups do not contain comparable patients. In any case, I think a patient, especially if he has been ill for several years, can furnish his own basis for comparison. If, as did most of the patients of this series, he has had disabling symptoms for several years without relief and then improves rapidly over a period of 6 to 12 months, we can reasonably credit the change to his psychotherapy.

Concerning comparisons with results of psychoanalysis, I must first note that exceedingly few reports of results with psychoanalysis have been published, and almost none in recent years. In the largest series of patients treated by psychoanalysis (from the Berlin Psychoanalytic Institute),[17] slightly less than two-thirds were considered cured or much improved. From my own experience with psychoanalysis and the psychotherapy I have described here (repeating that these overlap somewhat in processes), I believe the results obtained in the patients reported as "much improved" in this series are equal to those I am accustomed to observe with psychoanalysis, certainly so with my own patients.

I attach importance to the follow-up studies of these patients because I think they help to counter the possible objection that the patients' improvements were transient and derived exclusively from the influence of suggestion, as a flight from therapy into pseudohealth, or out of a wish to please the therapist. In the vocabulary of psychoanalysis, these are the "transference recoveries." We do not expect improvements of this kind to last more than a few weeks or months or to survive long the patient's separation from the therapist.

Relevant in this connection also was the fact that every one of the "much improved" patients initiated the discontinuance of therapy on the grounds that he had obtained what he had come for and could now carry on alone. Moreover, and unexpected by me, important anxiety about separation from the therapist occurred in only one of the patients. This lack of dependency on the therapist may have derived from the fact that from the beginning of therapy the patient's attention was directed toward what he would have to do for himself, and away from unrealistic expectations of my doing everything for him. Finally, the observation in most of the improved patients of this series that they improved further after termination of therapy suggests the continuing and self-reinforcing practicing of what the patient had learned in therapy.

If, then, these methods can bring about substantial results in the treatment of psychoneuroses, our attention becomes drawn by the important contrast between the number of interviews required in this series (averaging 61) and the number required in most psychoanalyses (averaging several hundred). Wolpe [12,13] and Herzberg [10] have reported even better results with the same or fewer interviews, using techniques after which to some extent I fashioned the ones reported here. The confirmation by others of such results may open a new phase in the treatment of psychoneuroses.

A question can arise as to whether "fundamental" changes can occur in patients after such a small number of interviews as that reported in this series, or the even smaller number reported by Wolpe for his series. We should try to approach this question without preconceptions based on custom. There is, after all, no a priori reason why a substantial change in personality should occur after 100, 500, or 1,000 interviews. Presumably what does occur will depend upon how usefully the time is spent, and also, so I believe, upon how usefully the patient spends the much greater time when he is not with the therapist. Regarding the first factor, I think it possible that much time is wasted in psychoanalysis by free association. Competent psychoanalysts are perfectly well aware that it can be so wasted, but before they catch up with a patient's idle or resistant use of free association, much time may have flown by. Apart from this, the pursuit of past experiences and repressed emotions through free association, even when used most constructively, may be unnecessary and hence wasteful of the patient's time. The relevance of the recall of forgotten memories to recovery from a psychoneurosis was questioned years ago, notably by Alexander and French.[18] More recently, Wolpe has cited cases which show the irrelevance of derepressions for the complete recovery from a psychoneurosis.[12,13] The patients of the present series add to this evidence, because they talked very little about the remote past and improvements bore no relation to recovery of past memories. I do not mean to say that discussion of the past and recovery of forgotten memories contribute nothing to a patient's improvement. We have ample, and often dramatic, evidence that they do. However, we understand little of how this contribution occurs. Abreactions may benefit chiefly or exclusively through the accompanying emotional arousal, which then facilitates unlearning and relearning.

Critics accustomed to the assumptions of other kinds of psychotherapy, e. g., psychoanalysis, may allege that the kind of psychotherapy described here constitutes a direct influence of the therapist on the patient. I agree that it does, but believe also that such influence occurs in every psychotherapy. We influence patients whatever we say to them, and if we say nothing at all. The only relevant question at issue in this connection is how beneficial our influence proves to be. This we can decide only by a careful comparison of the results of different kinds of psychotherapy and the ease, speed, and expense with which they are brought about.

In the psychotherapy described here, the psychotherapist can influence patients harm-

fully through the play of his own neurotic motives. But I do not think the danger of such harmful influence any greater than that with other kinds of psychotherapy; and it may be less than with psychotherapies which naïvely assume that the therapist can remain detached, free from the problem of values, and allow the patient to find his own solution to his difficulties without influencing him in one or another direction.

Supposing further confirmation of the results reported for this series and for those of Herzberg and Wolpe, we shall still need to ask for what patients infrequent interviews will suffice. I think the patients of this series who did not improve might well have done so if they had been able to receive more intensive contact with myself. I believe that frequent interviews will continue to be necessary, pending further advances, in several groups of patients. These will include those who are exceedingly anxious and need much support; those who are too inhibited to be brought into constructive contact with persons in their natural environments, and who therefore first require corrective experiences with the therapist, and those whose present environment does not provide them other persons with whom they can interact intensively and constructively. Unmarried persons who readily withdraw from members of the opposite sex exemplify this last group.

I consider the present series of patients entirely unsatisfactory for settling any of the issues raised by their treatment and study. Clearly, a much larger study is now required, and it should include more objective methods for evaluating the results of psychotherapy. I think there are important and identifiable differences between the psychotherapy described here (and that described by Wolpe), psychoanalysis, and so-called supportive psychotherapy. It should be possible to separate them operationally and test their results on a large series of patients. The results of the present, small series and the somewhat similar, and larger, series of Herzberg and Wolpe strongly recommend the value of such a larger study, which we propose to undertake.

## Summary

Twenty-one psychoneurotic patients were treated psychotherapeutically, with the therapist attempting to instigate new behavioral responses on the part of the patient toward the persons in his environment. Therapeutic interviews were focused chiefly on the patient's current relationships. The therapist used his influence covertly to encourage new responses in the patient.

Fourteen of the patients were judged "much improved" after treatment. Follow-up interviews eight months to several years later showed that the improvements had been sustained.

The average number of interviews required for the treatment of the "much improved" patients was 61. The article discusses briefly some of the theoretical and practical aspects of the comparatively small number of interviews required for the treatment of psychoneuroses in this series of patients.

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# Urinary "Epinephrines" in Patients with Mental and Emotional Disorders

*Apparent Occurrence of an Adrenolutin-like Substance in Urines of Psychotic and Depressed Patients.*

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## Introduction

In 1956 a colorimetric method was described for measuring the concentration of epinephrine and related substances in the urine.[1] The method detected not only epinephrine and norepinephrine but other α-hydroxycatecholamines, trihydroxy- or tetrahydroxyindoles, and 3,5-dihydroxy-6-oxyindoles; the method did not distinguish one from another, since readings were made at only one wavelength. The presence of greatly increased amounts of this class of substances in the urines of psychiatric patients was reported in a preliminary study in 1957.[2] The present report presents findings in a much larger number of patients.

The test used is based on color formation during a reaction between *o*-naphthalenediamine and the *o*-dihydroxyphenyl-α-hydroxyethylamines (epinephrine, norepinephrine, isopropylnorepinephrine), some simple derivatives (3-methoxyepinephrine and 3-methoxynorepinephrine), and indoles formed by the oxidation and cyclization of all these compounds or of certain precursors. The reaction takes place in the presence of peroxide at an acid pH. Di- and trivalent cations markedly increase the intensity of color formation by *o*-dihydroxy- and *o*-hydroxymethoxy-α-hydroxyethylamines; $Ni^{++}$ and $Fe^{+++}$ have thus far been found most effective. These cations have no effect on color formation in the reaction of *o*-naphthalenediamine with indoles.

The condensates formed from the dihydroxyphenylethylamines have a red color, with absorption maxima between 490 and 512 mμ; those formed with the indoles are yellow and have absorption maxima between 450 and 475 mμ. Fractions of the condensates that are soluble in organic solvents are stable for several months at 4 C. The absorption curves of the material extractable by organic solvents have the same general characteristics as those of the crude aqueous condensates, but their absorption maxima have shorter wavelengths. Condensates formed with *o*-dihydroxyphenylethylamine without an α-hydroxy group, i. e., dopamine, or with *o*-dihydroxyphenyl-α-ketoethylamine, i. e., methylaminoacetocatechol (Adrenalone) do not yield enough color to produce measurable absorption when these compounds are present in quantities up to 10μg.

The reaction used therefore measures the excretion of three catecholamines known to be present in the mammalian adrenal medulla, i. e., epinephrine, norepinephrine, and isopropylnorepinephrine (and their 3-methoxy derivatives), but not the fourth, i. e., hydroxytyramine (dopamine). It also measures, at the same time, indoles that might be formed from the three catecholamines or from their precursors (tyrosine and phenylalanine form indoles[3]). However, the reaction does not distinguish any one of the substances named.

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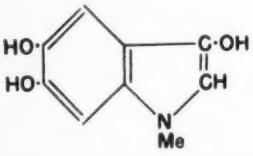
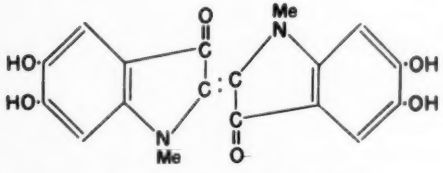
During these studies it was observed that in the case of urines from psychotic and from depressed patients some component or components of the mixture measured became so changed on standing in an aqueous acid solution in the refrigerator overnight as to be no longer detectable by the method used. This phenomenon has thus far not been observed with urines from normal subjects, nondepressed patients with neurosis, or patients with pheochromocytoma, but only with urines from psychotic or depressed patients. The nature of the substance or substances in this unstable component is still unknown. However, certain studies suggest that some or all of this fraction is an adrenolutin-like substance.

In 1950 Harley-Mason[4] reported that adrenolutin (1-methyl-3,5,6-trihydroxyindole) in acid solution absorbs oxygen from air slowly when cold and rapidly when heated, to become 5,6,5′,6′-tetrahydroxy-1,1′-dimethyl indigo (Fig. 1). Adrenolutin is the only indole or member of the epinephrine series or their oxidation products thus far reported to behave in this fashion. There is evidently a striking similarity between the chemical behavior of adrenolutin and that of the unknown component of the patients' urines studied. Indeed, Hoffer and Kenyon[5] have shown that blood serum from schizophrenic patients transforms epinephrine into adrenolutin in vitro. The present report records the frequency of occurrence of the unstable component in the urines of various categories of patients and describes studies made in attempting to show that it is or contains an adrenolutin-like substance. It should be noted that the method of preparing extracts of urine used here must destroy much, or perhaps most, of the adrenolutin-like substance found. Preliminary results obtained in our current attempt to devise a method specific for adrenolutin-like substances in the urine indicate that the method used in the present paper may destroy as much as nine-tenths of such substances present. Accordingly, the findings of the present report must be regarded as highly tentative.




**I.** 1:methyl-3:5:6-trihydroxyindole




**II.** 5:6:5':6'-tetrahydroxy-1:1'-dimethylindigo

Fig. 1.—Structural formulae of adrenolutin (*I*) and its polymer (*II*).

## Material and Methods

One hundred fifty-five urines, obtained from 113 patients, were studied. The patients ranged in age from 15 to 88 years; 47 were men. The procedure used was as described previously.[1,2] Each 24-hour urine was collected in a jug that contained 5 mg. of penicillamine dissolved in 10 ml. of water. After the first voiding was put into the jug, 5 ml. of 10% HCl was added. The collecting jug was kept surrounded by ice in a large Thermos jug. In the cases of one or more urines from 97 patients, a second measurement was made after the extracts had been kept in the refrigerator for 24 hours. The patients' diagnoses were taken from the hospital records 6 to 30 months after the laboratory studies were made.

Since the unstable component was usually found in highest concentration in the urines of schizophrenic patients, several such urines were examined for adrenolutin as follows: Each 24-hour urine was collected as described above. It was then hydrolyzed by adjusting it to pH 1.5 with hydrochloric acid and heating it in boiling water bath for 30 minutes. It was then chilled. Phosphates were removed by precipitation, and the supernatant urine was absorbed on alumina (aluminum oxide) which was then washed three times with water; the material was then dried and eluted with 2.25 N acetic acid. The acetic-acid eluate was made to react with 2,3-naphthalenediamine as previously described[1]; the resulting compound was then studied by means of a Perkin-Elmer Spectracord with a Leeds and Northrup recorder, and the absorption spectra so obtained were compared with those obtained by reacting

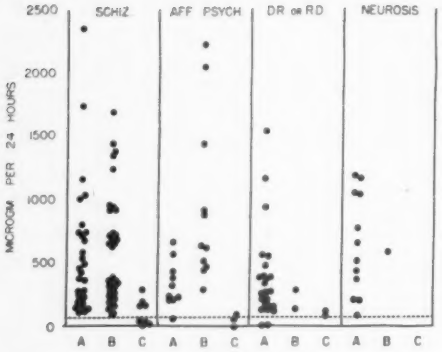



Fig. 2.—"Urinary epinephrines" per 24 hours. Each dot represents one urine collection. The horizontal broken line indicates the upper limit of normal. *A* indicates urines from patients not receiving tranquilizing drugs; *B* indicates urines from patients receiving such drugs; *C* indicates urines from patients at discharge.

pure adrenolutin (supplied by Dr. Floyd Eberts, of The Upjoin Company, Kalamazoo, Mich.) with 2,3-naphthalenediamine. Curves were also obtained using mixtures of adrenolutin and epinephrine in various proportions.

## Observations

The patients were classified in five categories, e. g., neurosis, reactive-depression or depressive reaction, affective psychosis, schizophrenia, and miscellaneous. The control subjects were those used previously.[2]

*Total Urinary "Epinephrines."*—The neurotic subjects excreted between 133μg. and 1,537μg. of "epinephrines" per 24-hour period (Fig. 2). The patients with reactive-depressions or depressive reactions excreted between 0 and 1,163μg. per day; only 2 of 26 were below 100μg. (Fig. 2). The patients with affective psychoses excreted between 56μg. and 2,046μg. per day; only one value was below 140μg. (Fig. 2). The schizophrenic patients excreted between 0 and 1,741μg. per day; only 2 of 58 measurements revealed values below 130μg. (Fig. 2).

The miscellaneous group includes six patients with alcoholic psychoses, four with drug psychoses, four with psychoses due to brain disease of old age, one with anorexia nervosa, and one with psychopathic personality. Except for the last-named, whose excretion was normal, and the patient with anorexia nervosa, who had an enormously increased output, all the others were in the same range as the rest of the patients of the present study (Table 1).

TABLE 1.—*Output of Urinary Epinephrines by Psychotic Patients*

| Diagnosis | Urinary "Epinephrines," μg. per 24 Hr. |
|---|---|
| Alcoholic psychoses | 56, 121, 214, 296, 792, 2,208 |
| Senile psychoses | 34, 184, 233, 276 |
| Drug psychoses | 65, 367, 678, 742 |
| Anorexia nervosa | 3,912 |
| Psychopathic personality | 0 |

*Effects of Tranquilizing Drugs.*—The use of phenothiazines, meprobamate, or reserpine did not influence the distribution of the values obtained. The patients with affective disorders who received such drugs put out greater amounts of "epinephrines" than the patients in this category who did not receive the drugs; however, they were sicker than the others.

*Effects of Improvement.*—Urine specimens were obtained in 13 patients at or shortly before they were discharged as improved. The values were all in, or a little above, the normal range; seven actually were normal.

*Effects of Emotional Stress.*—There was no opportunity to study systematically the effects of emotional stress on the output of "epinephrines." However, one chronic schizophrenic patient, whose output on five occasions was between 184μg. and 728μg. per day (average 423 μg.), put out between 1,240μg. and 1,373μg. per day (average 1,307μg.) when circumstances caused him to become moderately upset.

*Occurrence of the Unstable Component.* The unstable component was detected in almost all the urines from patients with schizophrenia, affective psychoses, and neuroses with depression (Table 2). Four of the eleven patients in these categories whose urines did not contain unstable components were improved, and the urines were obtained shortly before discharge (Table 2).

TABLE 2.—*Occurrence of Unstable Compound in Urines*

| Diagnosis | Positive * | Negative: Single Urine | Negative: Repeated Urine | Negative: At Discharge |
|---|---|---|---|---|
| Schizophrenia | 36 (3) | 4 | 0 | 2 |
| Affective psychoses | 14 (1) | 0 | 0 | 1 |
| Depressive reaction | 22 (1) | 2 | 1 | 1 |
| Neurosis | 1 † | 13 | 0 | 0 |

* Numbers in parentheses indicate number of patients who had one negative urine among the positives.

† A patient with a diagnosis of "neurosis with dissociation."

In addition, the material was found in four of four urines from psychotic alcoholic patients, in three of three urines from patients with drug psychoses, and in three of four patients with brain damage of old age. The patient with anorexia nervosa also excreted the unstable substance.

*Nature of the Unstable Component.*—The product of the reaction between 2,3-naphthalenediamine and the extract of schizophrenic urine showed an absorption spectrum with maxima at 4,550 to 4,600 A. (Fig. 3). Adrenolutin after reaction with 2,3-naphthalenediamine gives a similar curve, with a maximum at 4,500 A. (Fig. 4); but when it was mixed with epinephrine, the maximum shifted to between 4,550 and 4,600 A., depending on the proportions of each (Fig. 3); the mixture produced an absorption spectrum very much like that obtained from the reaction of 2,3-naphthalenediamine and extracts of urines from psychotic or depressed patients.

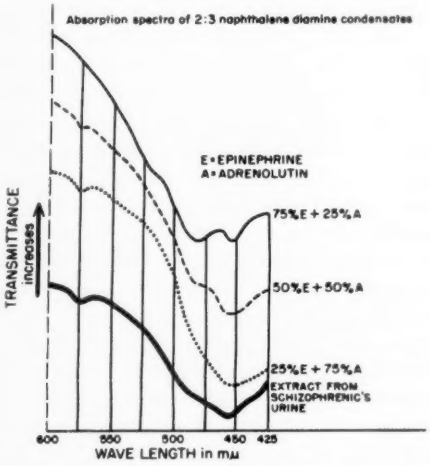



Fig. 3.—Absorption spectra of condensates of 2,3-naphthalenediamine with extract of schizophrenic urine and with mixtures of epinephrine and adrenolutin.

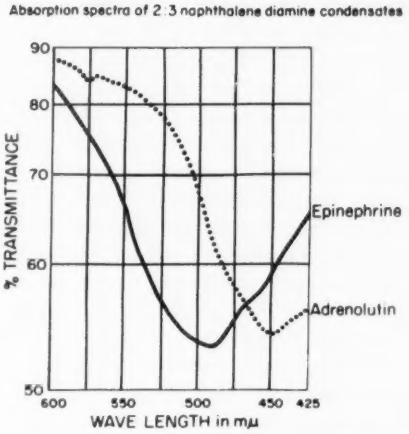



Fig. 4.—Absorption spectra of condensates of 2,3-naphthalenediamine with epinephrine and with adrenolutin.

## Comment

The data show that increased amounts of epinephrine and related substances are excreted in the urine of patients with a wide variety of mental and emotional disorders. The values obtained in neurosis and in neurotic depression were not markedly different from those obtained in schizophrenic and in affective psychoses. However, it must be borne in mind that patients with severest psychoses could not be studied because the test required their cooperation in the collection of all the urine voided during a 24-hour period, and the most severely ill could not cooperate.

The lower values found when the patients improved were not surprising. On the other hand, two patients showed findings that were quite unexpected. One a manic-depressive, manic patient excreted only 56μg. per day shortly after admission, and a few days later put out 2,046μg. in 24 hours.

The other, a schizophrenic patient, put out 0μg. on admission and 355μg. a day a week later. The findings in these two patients raised the possibility either that a peculiar metabolic state prevented the formation of "epinephrines" at first or else that the urines contained inhibitor substances. An explanation for the phenomenon must wait on the accumulation of additional information. It is possible that the reported decreased secretion of catecholamines caused by riboflavin deficiency [6] is relevant to this problem.

The medical literature contains only a few reports on epinephrine metabolism in mental and emotional disorders. Data obtained by means of the ethylenediamine-conjugation test on blood [7-10] are unreliable for epinephrine, according to most authors,[8,11-14] and need not be discussed. In normal subjects, emotional stress was found to cause an increased urinary epinephrine excretion by von Euler and Lundberg,[15] Hoagland et al.,[16] and Elmadjian et al.[17,18]; Raab and Gigee [19] used a method that measured urinary epinephrine, norepinephrine, and dopamine together and found no change in Vermonters. Pekkarinen and Pitkänen [20] reported normal values in the urine of three of four neurotic subjects. Elmadjian and associates used a cumbersome bioassay technique in their studies [17,21] and recorded high 24-hour excretions in some, but not all, of their schizophrenic subjects.

The differences in the methods used, unreliability of some of them, and the paucity of data make impossible any general evaluation of the literature on catecholamine excretion in nervous and mental disorders. The recent finding of Holland et al.[22] that 12-hour urine samples of schizophrenic patients contain no more catecholamines than normal should occasion no surprise, since these authors used the method of von Euler and Flóding.[23] Studies made in our laboratories two years ago by means of this method yielded the same findings.[24] The method was abandoned because of unreliable recoveries, because separation was effected by rapid filtration through alumina in a Buchner funnel instead of extraction by extremely thorough shaking, and because hydrolysis was carried out at pH's of 1.0 or below. Moreover, the substances measured by that method include dopa and dopamine. However, the fact that schizophrenic patients excrete so much of the unstable component suggests that their excretion of epinephrine itself must be normal, or at most only moderately increased, if the total urinary "epinephrines" are to be the same as in anxiety states.

Certain effects of the alumina used in most methods for estimating urinary catecholamines should be noted. It has been shown [25] that hydrolysis of esters, and also ring closures of some side-chains, takes place on the surface of pH 7.2-7.4 alumina ("almost neutral" alumina). Studies made here show that the unstable urinary component cannot be detected when the assay is carried out after the urinary "epinephrines" are extracted by adsorption on and elution from alumina washed with acetic acid. However, if the material eluted from the acetic-acid-washed alumina is readsorbed on the "almost neutral" alumina and eluted from the latter, then the unstable urinary component is detected by the assay technique employed in the present work. The values for the urinary "epinephrines" obtained either after direct adsorption on pH 7.2-7.4 alumina or after adsorption on and elution from acetic-acid-washed alumina and then treating with "almost neutral" alumina are comparable except for the losses previously shown in recovery experiments to result from adsorption and elution on alumina. Studies made here show that treatment of epinephrine, norepinephrine, isopropylnorepinephrine, dopa, and dopamine with "almost neutral" alumina does not result in ring formation involving their ethylamine group; therefore the effect of alumina used in the assay of urinary "epinephrines" appears to be hydrolysis of esters. Accordingly, it is probable that the unstable component has several ester groups, some split off by heat hydrolysis

and others detached on the surface of the pH 7.2-7.4 alumina.

The evidence presented here indicates, but does not prove, that urines of schizophrenic, manic-depressive, and depressed neurotic patients contain a mixture of epinephrine and adrenolutin. Proof that this mixture is actually excreted must wait upon determining the absorption spectra alone and in mixtures of all known derivatives of epinephrine, norepinephrine, and isopropylnorepinephrine and of the precursors of the sympathomimetic amines.

The source of the adrenolutin-like substance apparently found in the urine in psychosis is not known No information is available concerning possible enzymatic abnormalities that might cause the production of adrenolutin-like substances in psychotic and in depressed patients: These substances might be derived from catecholamines, or they might be made from a precursor, such as tyrosine.[3] In addition, 5,6-dihydroxyindole is an end-product of tryptophan metabolism. Recent work by several authors show that the greatest part of *injected* epinephrine, both in normal subjects [26-28] and in schizophrenic patients [28,29] is broken down to form 3-methoxy-4-hydroxymandelic acid. This suggests that the adrenolutin-like substance found here is made not *from* but *instead* of catecholamines.

Irrespective of the source of the adrenolutin-like substance apparently found in the experiments here described, the fact that adrenolutin bears a structural resemblance to many psychotomimetic substances, and that it has actually been reported to be psychotomimetic,[30] makes the finding of this kind of substance in urine in psychotic and in depressed patients important. Hoffer [30] reported that adrenolutin caused euphoria occasionally, and depression, irritability, and lack of interest frequently. Silly, irrelevant responses, hostile behavior, and hallucinations also occurred after injection of the drug.

The occurrence of the unstable component, apparently related to adrenolutin, in urines of moderately or severely depressed neurotic patients provides an alternative to currently emphasized psychodynamic explanations of the genesis of depression. The depression might very well be due to the formation of excessive amounts of an adrenolutin derivative—owing to some inborn or acquired enzymatic defect—when epinephrine or related compounds are produced in excess. On the other hand, it must not be concluded that the symptoms of psychosis are caused by indoles exclusively; earlier work has shown that the occurrence of hallucinations in schizophrenia may depend on changes in cerebral blood flow,[31] and that disordered thinking may be related to disturbances in the utilization of keto acids.[32]

## Summary and Conclusions

Studies on the urines of patients with a variety of psychiatric disorders revealed increased excretion of urinary "epinephrines," i. e., epinephrines and/or substances related to it, in most of them. The range of values was the same in the various diagnostic categories and was not influenced by administration as such of tranquilizing drugs. However, improvement, by whatever means effected, was accompanied by lowered excretions.

The urines of depressed and/or psychotic patients contained an unstable fraction that had properties similar to those of adrenolutin: Reaction of this fraction with 2,3-naphthalenediamine yielded a compound with an absorption spectrum similar to that of the compound formed in the reaction between pure adrenolutin and 2,3-naphthalenediamine. Available evidence indicates that the urines studied contained a mixture of epinephrine and an adrenolutin-like substance. Since the latter substance constituted much or most of the urinary "epinephrines" excreted by psychotic patients, it appears that the quantity of catecholamines excreted by psychotic patients is

much less than that by patients with anxiety neurosis.

The possible significance of these findings in interpreting the origin of certain mental symptoms is discussed.

Dr. Lewis M. Hurxthal's effort and enterprise helped to initiate this project. Dr. Robert B. Woodward, of Harvard University, and Drs. George Boxer and Karl Pfister, of the Merck Institute for Therapeutic Research, were most helpful with advice on certain chemical problems. The last two also synthesized several compounds that we used in our studies.

McLean Hospital (Dr. Altschule).

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## ANNOUNCEMENT

The American Board of Psychiatry and Neurology, Inc., wishes to announce the following schedule of examinations:

Chicago .....Oct. 19 and 20, 1959
New York .....Dec. 14 and 15, 1959
San Francisco .....March 14 and 15, 1960

DAVID A. BOYD JR., M.D.
Secretary-Treasurer

# Books

## BOOK REVIEWS

**Diagnostica psichiatrica: Parte speciale.** By Agostino Rubino. Price, 5,500 lire. Pp. 443. Casa Editrice V. Idelson di E. Gnocchi E. F., Naples, 1958.

This volume on psychiatric syndromes follows one on psychiatric symptoms by the same author. Psychodynamics and therapeutics are considered outside the scope of this volume, which is limited to a detailed, classically nosological description of psychopathology according to a strictly organic, biological viewpoint. In the foreword, the 1957 International Congress of Zurich is hailed as endorsement for such an orientation. Consequently, hereditary, constitutional, somatic, physiological, and chemical factors are stressed as underlying etiological components in any form of behavior pathology, ranging from psychopathy to hysteria. Each syndrome is described in terms of well-assembled, well-integrated, and outlined somatic and "humoral" causes. Attention is especially given to mental deficiency, epilepsy, toxic and venereal disorders, senility, and intracranial and cerebral disturbances. Surprisingly enough, there is a complete classification of language disturbances in schizophrenia, which is not, however, incorporated in the general biological persuasion of the text.

The biological orientation produces marked imbalances in the emphasis given to various syndromes. A rare disorder, like the deficiency of Hurler and Pfaundler, receives more attention and space than a more widely recognized one, like, e. g., childhood schizophrenia—the latter is given one paragraph. Developmental affective disorders receive three pages, while mental deficiencies and obscure, traditional textbook deformities occupy 70 pages, well documented with pictures and captions. Eight pages on psychopathies (ten of them according to this author) are unexplainably sandwiched between well-developed chapters on epilepsies (48 pages) and alcoholism (11 pages). Psychogenic and cultural factors, and pertinent research literature are either ignored or are mentioned as almost irrelevant after-thoughts and curious side-lights in otherwise lengthy footnotes. Not only are organic factors emphasized by more frequent citation of relevant research, but they are blatantly supported through the use of loaded introductory phrases ("undoubtedly somatic . . .," "undeniably organic," etc.).

This volume should be useful to state hospital neuropsychiatrists interested in pinning down details of classification. The research worker in mental health would find a wealth of summarized literature on the biological bases of psychopathology. They would be disappointed, however, to find authors cited without any further bibliographic reference—a common practice in European textbooks.

LUCIANO L'ABATE, Ph.D.

**Economics of Mental Illness.** By Rashi Fein. Price, $3.00. Pp. 164. Basic Books, Inc., 59 Fourth Ave., New York 3, 1958.

This volume is the second in a series of monographs to be published under the auspices of the Joint Commission on Mental Illness and Health. Dr. Fein, a professional economist, has succeeded admirably in fulfilling his task, namely, to examine and report on the dollars-and-cents aspects of mental health care. As such, this book will be of interest primarily to professional persons engaged in public health, administrative and institutional psychiatrists, economists, and legislators. This is not to say that other physicians, psychiatrists, and intelligent lay persons will not find much that is of interest in it. Although little in this volume is specifically pertinent to the psychiatrist or psychotherapist in private practice, he, and all others interested in contemporary American life, may read this report with profit.

It would be unfair to examine a scientific work without paying due respect to the author's frame of reference, his definitions, and his goals. Yet, neither the reviewer nor the reader is obligated to accept any of the author's premises as valid, or as reasonable, especially if he has specific grounds for finding fault with them. The value of this research report will depend wholly on the validity or specific usefulness of its premises and definitions. The main premises are these:

1. Mental illness is essentially similar to other illnesses; it is said to be the nation's No. 1. health problem (p. 4).

2. Most of the statistics deal with people hospitalized for mental illness; addictions, juvenile delinquency, private psychiatric care, social work, and other forms of counseling are not included (p. 6).

3. Mental illness is regarded as "an undesirable occurrence" (although Fein does not specify for whom it is undesirable, it is implicit that he means for "society"). Why? Because the person ceases to be a producer. Since this seems to me to be one of the most controversial premises, the author's statements on this subject will be quoted: "It is clear that, if we suggest that the society loses something when an individual is mentally ill, we imply not only that the individual fails to operate at his maximum capacity but that society could and would utilize him at his maximum if he could operate there. Put very simply, we imply: (1) that the individual could produce more if he were well than if he were sick; (2) that society would be prepared to have him produce more rather than less" (p. 12). That this is an assumption, and not a fact, is clearly emphasized throughout the discussion by Dr. Fein. My subsequent criticism, therefore, is directed at his use of this assumption to the exclusion of others, and not to the fact that he considers it.

Given these asumptions, the author estimates the costs of mental illness as a whole for the nation (in excess of $1,700,000,000 a year) and provides numerous breakdown figures in accordance with geographic distribution, age, sex, diagnosis, and many other variables. That mental illness, however defined, is staggeringly expensive—if by this is meant caring for the patients and estimates of their unearned incomes—is documented here in a probably hitherto unprecedentedly accurate and detailed fashion. Putting the book down, however, I could not help feeling troubled that more attention had not been paid to some of the more characteristic—or perhaps challenging—aspects of this problem. I would have wished, for example, that more attention had been paid to how mental illness differs from other medical problems and how this affects costs. Since the differences between so-called mental and organic illness are especially evident in relation to their social effects, it seems particularly regrettable that more evidence bearing on this aspect of the problem was not collected and analyzed.

The omission of another problem struck me especially forcefully. This was the subject of the mental patient's social usefulness as a *consumer*. Throughout the discussion, emphasis was placed on the individual as *producer* of goods or services. The assumption was made explicitly, as quoted earlier, that maximal production is a positive value. While no economist, I have difficulty in understanding this position, which makes no allowance for consumers. Is ours not a country and is this not an age in which economists have warned us of the dangers of *overproduction*? That this danger is feared is suggested by the steady pressure of labor unions for reduced working hours, the persistent specter of large-scale unemployment in spite of a huge work force engaged in producing armaments, the apparently mounting need for restrictive trade barriers, and so forth. Economists tell us, too, that the increasing size of the American family is something that will promote prosperity. Although it has the opposite effect in India and elsewhere, it is supposed to be "good" for America. The more mouths we have to feed, so the argument runs, the more we shall need to produce, the higher the level of employment and earnings, and so on, and in the end *everyone* will benefit.

I mention these opinions not necessarily because I think they are right or because I believe in them, but, rather, to raise a question concerning this study which the author has failed to raise himself. The question is this: Although the "mentally ill' constitute a burden for society—and for specific individuals—how much of this load is not really a burden at all, but is needed by society, at least now, in order for it to maintain its socioeconomic balance and traditional political configuration? We know as psychiatrists that many persons need to feel that some members of their family—or others around them—are "mentally ill." Enhancement of the subject's self-esteem is achieved by making the object pitied and inferior. Thus, since we regard children as *useful consumers*, why not consider "mentally ill" persons as such too?

The idea that a person's economic usefulness can be measured in terms of his (material) productivity seems to me to be applicable only if we assume that we operate in a milieu containing an excess of both unsatisfied needs and means for purchasing goods and services. Then anything that is produced will be readily consumed. Social equilibrium and increasing productivity do not form conflicting values. The relationship between these two values, however, has posed something of a problem for the economies of so-called open societies (K. Popper), such

as the United States, Great Britain, or France. State control of the economy apparently offers some ways out of this dilemma, but this has been achieved so far only at the cost of sacrificing many of our most treasured human values. Considerations such as these raise questions concerning the interrelations of the sociopolitical nature of the economic system, on the one hand, and the nature, incidence, and management of so-called mental illnesses, on the other. This problem, however, was not within the scope of Dr. Fein's study. It is, I think, unfortunate that it was not.

THOMAS S. SZASZ, M.D.
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**Language and Psychology.** By Samuel Reiss. Price, $3.75. Pp. 296, including Appendix. Philosophical Library, Inc., 15 E. 40th St., New York 16, 1959.

Language, as a symbolic function, is one of the phenomena which most clearly differentiates the human from the animal world. The present volume is both a plea for, and a method of, studying language as a means of obtaining insight into the characteristics of the human thought process. As an approach to the origin of language, this book offers a wide range of rich and suggestive ideas. It fails to satisfy as a scholarly work, however, primarily because the author does not include for elucidation and comparison either the ideas or the material of other investigators using related approaches.

The problem, as Reiss sees it, is to determine what sort of entities words are and by what means they become linked to their range of meanings. The author presents, as his answer to this problem, the thesis that the process of vocabulary creation is essentially one of metaphor creation; that is, by a process of "idea-association," which is both dynamic and imaginative, a basic word sound can become linked to a wide range of related meanings. The basic word sounds of any language are simply action or striking sounds, such as splash, click, plop, or snap. Reiss points out that these word sounds are not physical, but psychological, imitations of action or striking sounds; that is, "the quality of the sound of the word itself, as psychologically construed, is assimilated to a quality of the action linked with the sound." Reiss further states that these word sounds arise as a dynamic response to a dynamic activity or situation and thus involve emotion as well as idea. A major consequence of the total motor-affective situation out of which basic word sounds arise is that these words become linked "imaginatively" with a whole cluster of meanings or ideas, provided the same action is singled out as the essential descriptive feature. A variation in word sounds corresponds with variously emphasized aspects of the total dynamic situation. The presentation in each chapter of extensive word lists is an attempt to demonstrate concretely the wide range of both sound and meaning variants of any simple striking sound.

It is the essence of Reiss' approach that an understanding of language cannot arise without a willingness to deal with the concept of meaning. Meaning, for him, is intent, and exists as something apart from the concrete language by which it is conveyed. Words are mere hints to the intended meaning, and the success of communication "depends on the assumption that the communicants are capable of attuning to each other by possession of a common mentality."

Within the framework presented, Reiss discusses the place of poetic metaphor and of dialects in the process of vocabulary creation, and presents, in the Appendix, an analysis of the Japanese language to show that, although starting with different sound preferences, the process of vocabulary creation is the same for all languages.

Reiss has an intriguing and provocative approach to the origin of language and its implication for an understanding of human thought. It is particularly unfortunate, therefore, that the presentation tends to act against acceptance, or even, perhaps, proper consideration of the ideas expressed. There were, in particular, three aspects of the presentation which produced in this reviewer a marked feeling of frustration. The first had to do with the looseness of some of the concepts employed by the author, primarily that of "idea-association" and its relationship to "metaphor-creation." He seems to imply that all words other than the basic word sounds are metaphors. However, evidence from studies of primitive languages suggests that the linkage of names to multiple objects may arise in response to perceptual togetherness in a natural setting, and, further, that a distinction can be made in the development of linguistic activity between words used concretely (as an intrinsic part of an object or action) and those same words used symbolically ("true" metaphor). In order to evaluate this, as well as other evidence within the framework offered by the author, a more careful delineation of the implications of these two concepts appears necessary. The second aspect concerns the occasional lacunae in the

explanatory process. Reiss has written two previous books on approximately the same subject matter. Rather than repeat an explanation, the author simply refers to the fact that he had spoken of this in previous books. While an author cannot be expected continually to repeat information, many references occur at just that point at which further explanation is necessary to make meaningful the statement offered. Without such explanation, some of his statements appear as dogma to be accepted by the reader as an act of faith. The third aspect concerns the absence of references to any but his own writings. This was particularly disturbing to this reader because Reiss' general approach has much in common with that of the developmental psychologists, notably Heinz Werner, whose theoretical framework is more disciplined and systematic, and extensively documented. Presentation of some of this very pertinent material, culled from studies of nonliterate cultures, the language of children and of pathologically disturbed adults, and from experiments with normal subjects, might increase the scope of the concepts presented and make them more understandable to a reader who has not had previous contact with them.

In summary, one may say that this volume is not likely to appeal to those looking for precise hypotheses supported by extensive experimental evidence. However, in a field in which such precision has often been accompanied by a relative loss of the essential character of the thing studied, the present approach should be a welcome contrast. The ideas presented herein may well provide avenues for meaningful research.

KAYLA J. SPRINGER, Ph.D.

**Traite de psychiatrie.** By H. Baruk. Two volumes. Price not given. Pp. 1,569. Masson & Cie, 120 boulevard Saint-Germain, Paris 6°, 1959.

This manual, by the associate professor of mental diseases and of the brain at the University of Paris, chief physician of the national sanitarium at Saint-Maurice, is a clear and concise summary of traditional French clinical psychiatry, together with brief accounts of recent developments in that field and a description of the author's extensive investigations in the biological, social, and moral foundations of mental disease. It is written in a lucid style which makes easy reading. There is a minimum of metapsychology, for which reason it will doubtless be accused of superficiality, especially in the U. S. A. This relative neglect of the vast superficial systems of hypotheses is due not to ignorance of them but, rather, to the author's agreement with his distinguished predecessor, Esquirol, who wrote in the preface to his treatise on the same subject: "Clinging to the facts, I grouped them by their affinities, I described them as I have seen them, I rarely sought to explain them, and I halted before the systems which have always seemed to me more seducive by their splendor than useful in their application."

Moreover, any attempt to insert a lot of so-called dynamic explanation would have resulted only in making a scrapbook "more inclined to confuse than to instruct," as a reviewer remarked of a recent American textbook. It should be mentioned also that child psychiatry and forensic psychiatry are omitted; the reader is referred to the author's previous discussions on these subjects, in the *Traité de pédiatrie* of Debré, Lesné, and Rohmer (Gaston Doin & Cie, Ed.) and to his *Précis de psychiatrie*, published in 1950.

The first volume is divided into two parts, of which the first deals with the concept of personality and methods for its examination. Baruk maintains that in conceiving the personality the spirit is generally confused with its instruments. The enormous development of specialized studies, tests, and technique, and especially the specialization in a single technique, has ended by causing the psychiatrist to lose sight of the whole. A second cause of that confusion is the exclusive and excessive cult of objectivity. It should not be concluded that only material phenomena exist and that the spirit which commands them has no legitimacy. One arrives thus at a philosophy which grants existence only to objects and ignores the subjects. A third cause, paradoxically, is a disincarnate spiritualism, conceiving the spirit in an absolute and metaphysical form, rejecting it outside the person. A fourth cause of misunderstanding the personality is of a social order, notably expressed in certain American psychosocial studies of the problem of leadership, which should be based on the general uniformity and express the prevailing opinion. Such a society would mechanize personality and be deprived of prophecy, creativity, and inspiration. The author pleads against the separation of soul and body.

In the second chapter the author discusses methods of examining the disorders of the personality as distinguished from those of its instruments of execution. This is the principal

difficulty in psychiatry—to make a correct, just, and impartial observation. The first essential is to gain the confidence of the patient and then be absolutely frank and loyal with him. Once these fundamentals are granted, it is then advisable to follow a definite plan and method. The observation will include the description of the attitude of the patient, of the outstanding symptoms, then the details of his personal and familial history, then the details of his pathological history and the diseases from which he has suffered, then a summary of the mental functions, intellectual and affective, and of his behavior, and especially the presence or absence of hallucinations. These observations must be written at the time they are made. Finally, the psychiatrist should remember that he is a physician and make a complete neurological and general physical examination. Afterward the family should be thoroughly questioned and various special biological and psychological examinations made.

Although it is fashionable at the present time to underestimate French psychiatry as "purely descriptive," accurate clinical evaluation of patients is as important in psychiatry as in other branches of medicine.

The second part of this treatise is concerned with semiology. Here one finds clear, vivid accounts of such basic syndromes as anxiety, depersonalization, melancholia, mania, alternation, confusion, hallucination, delirium, dementia, and debility. It is absolutely essential that any student of mental disorder master these disorders of the personality before attempting to understand the various systems of explanation, which will otherwise only confuse him; he must have a solid basis of factual observation, laboriously clarified by our predecessors, to which he can refer. Since it is possible for him to acquire this basis by his own efforts only after many years of experience, it is necessary that he utilize the distilled experience of generations of psychiatrists who have patiently followed and recorded these phenomena. In this field the French psychiatrists of former generations were acknowledged masters. This second part is a concise, eloquent summary of their experience, illustrated by case histories. The discussion of the psychomotor disorders contains also an account of the author's own extensive experimental studies.

The second volume discusses the various theories which attempt to explain the disorders so eloquently described in the first volume and the methods of treatment based upon them. The author insists that only a long experience and a thorough knowledge of the evolution of a mental disorder will enable the psychiatrist to judge the effectiveness of any method of treatment. He discusses also the matter of the moment in the evolution of a disease when a certain method may be useful, at other times harmful, and warns of the adverse reactions which may be provoked in the patient by the attitude of the physician. "In a word, the psychiatrist must detach himself from a rigid nosographic classification in order to follow the fluctuating stages of the mental symptoms in the course of the varied afflictions of the nervous system. For the notion of fixed and definitive diseases must be substituted that of psychopathic reactions, often transitory, susceptible to regression even after a long evolution and amenable each time that it is possible to an etiological treatment, but also to physical and mental hygiene, which may sometimes lead to amelioration or even to veritable resurrection."

There follows a discussion of nonspecific biological treatments—pyretotherapy, shock in its various forms, chemotherapy, and psychosurgery. The author calls attention to abuses of these methods, particularly psychosurgery. Concerning the last, he remarks: "One sees that the clinical, physiological, therapeutic, juridical, and moral considerations which we have recalled remind physicians forcibly that the problem of psychosurgery is one of the gravest problems of medical morals which is before our generation."

In his discussion of the specific etiological treatments the author says there are two situations which must be considered:

"1. In the first case one is dealing with signs of a local anatomic or dynamic involvement with some mental reactions superadded. We have here to deal with various neurological affections, with cerebral lesions, or certain encephalopathies studied with their treatments in the second part of this work.

"2. In the second case, we are concerned with psychopathological syndromes related to a diffuse or superficial dynamic cause which has affected the nervous system. . . . The etiological problem is more one of general biology or psychopathology than of neurology."

He then proceeds to discuss the various dynamic causes capable of giving rise to psychopathological syndromes, keeping in mind that the dynamic causes are not always biological and that a place must always be reserved for moral factors.

Toxic-infectious, toxic, and serological troubles are described. Over one hundred pages are devoted to syphilis and tuberculosis, despite the fact that these troubles, as the author remarks, have almost disappeared from our hospitals; nevertheless, these chapters are excellent historical summaries of a past psychiatry with which every student should be familiar. It is evident that the author has no new or more effective therapy to offer for the most prevalent toxemia, that due to alcohol. One excellent chapter is devoted to what is now generally called somatopsychics, that is, to those mental symptoms provoked by such ailments as appendicitis, hepatitis, cholecystitis, dysentery, Graves' disease, renal insufficiency, epilepsy, circulatory disturbances, and cancer. Various focal cerebral diseases with symptoms predominantly mental and their bearing on the problem of consciousness are also discussed.

In the last chapter the author elaborates a field which he calls psychiatric humanism. Much of this material he has already published in more detail in his *Psychiatrie infantile,* his *Psychiatrie sociale,* and his *Psychiatrie morale,* of which Chapter XI deals with the following subject: "From the biological to the social, and from the social to the moral in a synthetic science of man." He summarizes his thesis as follows: "The study which we have just made above, of the degeneration and decadence of human societies, illustrates well the title of that chapter. Degeneration was at first viewed from an exclusively biological angle, and this conception finally led to excesses, to natural selection, to the elimination of subjects supposedly trained, and, finally, with Hitler, to the massacre of mental patients and worse horrors. The biological point of view must be completed by a social point of view. This latter point of view shows the role of society in the production of subjects injured in their nervous systems, by misery, by the exploitation of man by man, by alcoholism, by insufficient or improper food, absence of social hygiene, abuse of power by interests opposed to the general interest. This social point of view, already developed by Morel, is, fortunately, in a stage of rapid development; but it still encounters much resistance, and it must be completed by the moral point of view, that is to say, by the amelioration of the relationship of man to his neighbor and by elimination of the authoritarian climate, which pushes man to despair and makes him ill. Because of the lack of moral culture and social justice, one sees develop a veritable moral and social degeneration, with a stifling conformity, a disdain of man, a spirit of servility and oppression, a multiplication of toxic causes, of which alcoholism is the most obvious and the most productive of mental disorder, the enormous development of toxicomania, sexual aberration, intrigue, sullen struggle, and hypocrisy between man and man. The moral climate is developing in the direction of successive and continual wars, which destroy the equilibrium of nations and create a perpetual ferment of fear—fear of war, fear of secret denunciation, fear of police methods, fear of the authorities, fear for the future, etc.—all those fears . . . which cloud the human perspective and constitute important causes of mental troubles. Thus social and moral degradation prepare biological degeneration."

The section on "psychotherapy and views of man" is very interesting. Baruk was born and educated in France. His father was a psychiatrist, who transformed the psychiatric services in France. But he is also Jewish, with a mastery of the Hebrew language, and Hebrew history and literature. He taught psychiatry in Israel for a while. This combination gives him an interesting viewpoint toward modern psychotherapy and its insistence that psychiatry must be a "complete science of man." He points out how ignorant Freud was of the literature and fundamental viewpoint of Judaism. As one example he takes Freud's statement that the Mosaic admonition to love one's neighbor as oneself is an impossible ideal. He points out how Freud took this out of its context, in which man was advised not to let the sun set on his anger toward his neighbor but to tell him frankly of the offense, so that he might not feel the need of taking revenge and thus be able to love his neighbor as himself, thus avoiding repression and consequent illness or vengeance. This entire discussion of psychiatric humanism is very interesting and unusual, ending with an account of the author's own *psychiatric morale expérimentale.*

The work of this contemporary French psychiatrist merits the serious attention of American psychiatrists. Unfortunately, it would be a long and arduous task to translate it and, in its original language, few psychiatrists in this country will read it. When will the social atmosphere in this country again make possible for our young people to master, in the course of their education, at least one foreign language, while awaiting the arrival of a broader Middle Age, with a universal scholarly tongue, not only for Western Europe but for the whole world?

PERCIVAL BAILEY, M.D.

**The Teaching and Learning of Psychotherapy.** By Rudolph Ekstein and Robert S. Wallerstein. Price, $6.50. Pp. 334. Basic Books, Inc., 59 Fourth Ave., New York 3, 1958.

Modern psychiatry is at present involved in perfecting and discriminating various psychotherapeutic techniques. There are many studies now supported with adequate funds that are oriented toward understanding the therapeutic relationships that offer promise for helping patients of all types. Some of these are restricted to the psychoanalytic procedure; others are more general and are devoted to therapies that are more limited in scope and more open in relationship between doctor and patient. Naturally, each training center attempts to orient its students in the best ways of handling the therapeutic problems that arise within a wide variety of relationships established for the many purposes included under the heading of psychotherapy. There is a great deal of difficulty among the faculties of these training centers in establishing any modal procedures because each supervisor of students of psychotherapy has developed his own life style and through his individual investment of the techniques is unsympathetic to those carried on by others. The student often becomes bewildered and is not grateful for the opportunity to observe a wide variety of techniques. He feels confused and resentful that final positive words of details applicable to every therapeutic situation are not given to him without emphasis and authority. He finds it difficult to imagine that he will ever be able to find his own individual style. However, usually this is exactly what happens, not in the training program itself but after the student has been on his own for a while and begins to synthesize the bits of information he has learned from a wide variety of supervisors. Then, having digested and being ready for assimilation, he performs according to his own personality requirements.

Most training centers are concerned with methods of supervision, and supervisors spend a great deal of time discussing the students, the supervisors, the patients, and their multiple interrelationships. Usually such seminars consist in repetitive statements, which never seem to end. Finality is rarely achieved for any facet of a supervisory problem. It is, therefore, with a great deal of anticipation that we awaited the book of Ekstein and Wallerstein, who spent many years in studying the teaching and learning of psychotherapy in Topeka. We were not disappointed by any means, because they have written a book with detailed examples of the therapeutic and supervisory processes that is a model on which many training centers can base further work. Perhaps recounting the headings of the various chapters will give some idea of the material included. Under the heading of "The Training Setting" are included chapters on "The Basic Model of Supervision," "Administration and Learning," "The Clinical Setting and Its Structure," "Training for Research," and "The Professional Identity of the Psychotherapist." Under the heading of "The Beginning Phase" are included "The Supervisor Meets the Student," "The Therapist Meets the Patient," and "The Supervisor and the Student-Therapist Dicuss the Patient." Under the heading of "The Learning Process" are included "Supervisor and Student—Problems About Learning," "Therapist and Patient—Learning Problems," "Supervisor and Student—Therapist and Patient—the Parallel Process," "On the Psychology of Emergencies," "Following the Process of Supervision," and "Supervision *vs.* Psychotherapy."

Finally, under the heading of "The End Phase" are included chapters on "The Utilization of Recordings," "Evaluation and Selection," and "Guide to the Literature," which is indeed an excellent guide to the literature and a fine bibliography. And there is an adequate index.

The thousands of details incorporated and exemplified in this book cannot be stated even in abstract form in a book review. All that can be said it that it is a fine monograph which should be in the hands of all teachers of any form of psychotherapy, and students of psychotherapy will do well to read it also. The authors should be congratulated in having produced this monumental work.

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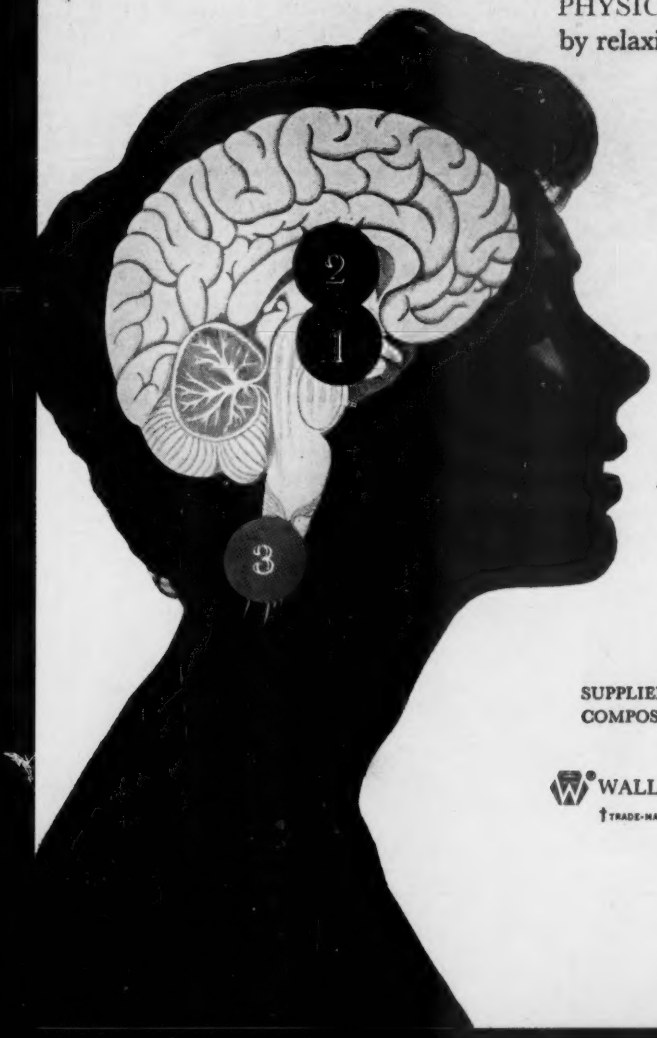


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